AUTOMOTIVE INDUSTRIES

Vol. 70, No. 20 • THIRTY-SIXTH YEAR • May 19, 1934

Car Sales Resume Up Trend

May production estimated at 320,000—New Models Delayed

by Athel F. Denham
Detroit Editor, Automotive Industries

DETROIT—Retail sales turned upward last week regaining some of the ground lost in the early days of May but it is still impossible to forecast with any accuracy what the total for the month will be. While production did not show a similar advance, present schedules point to a May total of about 320,000, or approximately 100,000 more than in the same month last year.

To counteract the adverse effects of the recent price increases on sales, a number of producers are rushing through lower-priced editions of their present lines to stimulate demand. This development has tended to delay new model plans and, as a result, tool and die work on 1935 models was being pretty generally held.

While four major producers in this area apparently are about to make major purchases of new equipment, including machine tools, it appears that these purchases are not being made primarily in connection with new model programs, but rather to improve production facilities on present models.

As a matter of fact, it is not likely that plans for the coming year will be finally determined by major companies until after Congress has adjourned and the industry has had a chance to take stock of the problems created by federal legislation. Potentially the labor situation today is perhaps even more critical in some ways than at any time except when a general strike in the industry was threatened.

There is a rather general feeling that labor organizations will attempt to call strikes when and as producers begin production on new models. Unless ameliorated, this situation undoubtedly will result in delaying announcement of new cars well into the fall with consequent expected lower levels of output and employment during the late summer.

(*Turn to next page, please*)

Harvey S. Firestone shown with the largest and smallest tires ever produced by his company. The big tire is a 20.00 x 10 in. designed for trailers on large excavation and construction projects. The small tire is for tailskids on government airplanes

Manning Resigns Stinson Presidency; Name Deweese

CHICAGO—Following the resignation of L. B. Manning as president of the Stinson Aircraft Corporation of Wayne, Michigan, directors of the company announce the appointment of B. D. DeWeese to head the company. Mr. DeWeese has been vice-president and general manager of Stinson since 1930.

Fisher Strikers Agree to Return

AFL Flouts President's Collective Bargaining Rules on Negotiations

FLINT, May 17—The Buick assembly line will probably be reopened Friday or Monday as the result of an agreement under which Fisher strikers are to return to work pending the outcome of negotiations with the Fisher management in Flint and/or through the Automobile Labor Board.

Since Thursday of last week the strike

(*Turn to page* 610, *please*)

U. S. New Car Registrations and Estimated Dollar Volume by Manufacturing Groups

	First Quarter 1934 and 1933 Percentage of Total Units		Percentage of Total Estimated Dollar Volume	
Chrysler Corp.	24.6	21.2	24.1	19.6
Ford and Lincoln	30.8	17.6	26.5	15.4
General Motors	35.1	49.8	37.4	49.5
All Others	9.5	11.4	12.0	15.5
Total	100.0	100.0	100.0	100.0

For Automotive Industries' monthly estimates of dollar volume by price classes, see page 628.

World sales of Ford passenger cars, commercial cars and trucks totaled 278,553 for the first four months of this year, an increase of 158.6 per cent over the sales for the corresponding period of 1933.

Ford domestic production for this month is expected to reach 110,000 units, which is a production rate of 5,000 cars per day. This compares with 48,448 in May, 1933.

Chevrolet's April shipments to domestic, export and Canadian dealers was 109,706 units as compared with 59,953 units for the same month of 1933. Year-to-date shipments (April 30 inclusive) total 332,716 units, a gain of 124,427 over the corresponding period for 1933. Cadillac-La Salle deliveries for April were greater than for any other month since June, 1931. This organization has over 3,000 unfilled orders on its books.

Studebaker's export sale for April exceeded the March record by a comfortable margin and set a 57 month record. Latest reports from the Reo headquarters indicate shipment of Reo cars in April were three times the total for same month of 1933 and nearly 50 per cent above the March figure.

Dodge dealers report retail deliveries week ending May 12 of 4552 Plymouth and Dodge cars and 1067 trucks, the total representing a 9 per cent increase over the previous week. Used car and truck deliveries totaled 5467, virtually 50 per cent of total sales. Up to May 12 deliveries for year to date include 35,225 Dodge cars and 15,638 trucks.

April Plymouth sales are estimated at 34,000 units, compared with the total of 17,174 delivered at retail during April last year. Retail deliveries for the week ended May 5 were 7,106 units, an increase of 15.1 per cent over the 4,690 units sold during the corresponding week in 1933.

April production reached 45,850 units, compared with 24,618 units manufactured in April a year ago. Shipments for the month were 46,028 units, an increase of 93.07 per cent over the number shipped in April last year.

Automotive Stabilization to Be NRA Report Subject

WASHINGTON—NRA is expected to issue a report on stabilization of operations in the automotive industry shortly —probably within the next two weeks.

New Challenger Terraplane Is Priced $45 and $55 Lower

DETROIT—Hudson Motor Car Co. has announced a lower priced edition of the Terraplane 6 called the Challenger series, selling at from $45 to $55 under the standard line. Major differences are in the matter of trim and finish. The new models have conventional front axles, Axleflex being extra equipment.

A comparison between the prices on the new series and the standard line follows:

	Challenger Series	Standard Series
Coupe	$565	$610
Rumble coupe	610	655
Coach	575	630
5-Pass. sedan	630	685

2,666,000 Used Cars Sold in the U. S. in 1933, N. A. F. C. Averages Indicate

CHICAGO — Automobile dealers in 1933 sold 178 used cars per 100 new cars delivered, according to averages released this week by the National Association of Finance Companies. With the exception of 1932, when dealers sold 186 used cars per 100 new ones, this is the highest level this ratio has ever attained.

On the basis of these averages the nation's car dealers sold 2,666,000 used cars in selling 1,494,000 new ones, a total of 4,160,000 units. These totals compare with 2,040,000 used cars, 1,096,000 new cars and 3,136,000 total units in 1932.

Trade-ins figured in 86 per cent of last year's new car sales, this figure also being the highest on record except for 1932, when it reached 89 per cent. The percentage of trades on used cars, however, set up a new record with 51.5 per cent, as compared with the previous high in 1930 of 49 per cent.

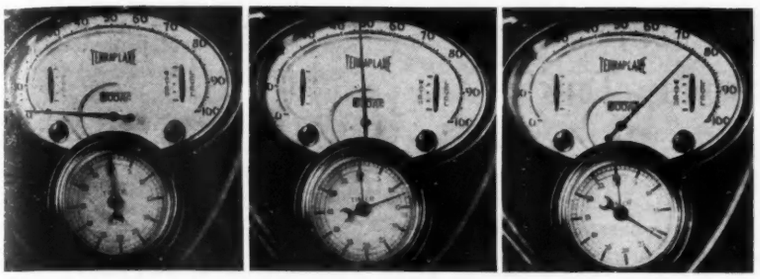
Reflecting the economic improvement, the percentage of new cars sold on time increased from 55 per cent in 1932 to 57 per cent last year, while used cars financed jumped from 47 to 57 per cent of total used sales.

The averages also reveal a general tightening up on credits during 1933. The percentage of paper calling for more than 12 monthly payments dropped from the record high of 22 in 1932 to 13 per cent last year. Moreover, of paper purchased in 1933, only 12 per cent was with less than the standard down payment, while in the previous year this percentage was 14.

The combination of tighter credits and improving business resulted in a marked reduction in repossession losses. Where payments were limited to not more than 12 monthly, the loss per repossessed car dropped from $56 in 1932 to $39 in 1933. Even where payments were permitted over a longer period, the loss per repossession was cut from $69 to $58. On new car sales where 1/3 down was obtained, repossessions amounted to only 2.6 per cent of the total, as contrasted with 5 per cent the previous year. Where 25 per cent down was accepted, the reduction in the percentage of repossessions from 1932 to 1933 was 6.8 to 4.4 on new cars. Used car repossessions where 40 per cent down was obtained showed a repossession ratio of 10.4 per cent, against 7.1 per cent in 1933, and

Piccard Examines Precision Instruments

Stratosphere expert, with Madame Piccard and their friend, Edward J. Hill, Gordon Bennett trophy winner, inspect the automatic recorders in Pontiac Motor's police room. Madame Piccard is seeking Mr. Hill's aid in obtaining necessary final instructions to secure her ballonist's license



Photographing Acceleration

Simultaneous photographs of speedometer and stop watch provide a means of obtaining data from which an acceleration curve may be plotted. The three views above show results obtained in a test of a Terraplane

where a smaller down payment was accepted, the ratio was cut from 15 to 10 per cent.

Less comprehensive data on trucks indicate that 51.5 per cent of commercial vehicles were sold on time in 1933, as compared with 57 per cent in 1932. The corresponding figures on used truck sales were 56.9 and 58.5 per cent. Dealers sold 107 used trucks per 100 new ones last year, as compared with 105 in the previous years.

Although the percentage of non-recourse paper was about the same last year as in 1932—37.4, against 37.7—the number of companies accepting non-recourse deals shows an increase.

Toledo General Strike Threats Conversational

TOLEDO—Although threats of a general strike are still heard in this city plans have not progressed beyond the conversational stage. The local Central Labor Union is considering the move as a demonstration of sympathy for the automotive workers and as a possibility of securing a favorable union settlement of the Electric Auto-Lite and Bingham Stamping and Tool Co. controversy.

Common Pleas Judge Roy Stuart this week granted a temporary injunction to the Auto-Lite and Bingham managements forbidding strikers accused of violence from appearing in the vicinity of the affected plants. Labor leaders here have announced that should a general walkout be ordered the A. F. of L. will support the move with every legal means. Picketing otherwise is not restrained.

Rotary Electric Expands

DETROIT—Rotary Electric Steel Co. has started an addition to its cold rolled steel division to house new equipment for cold rolling strip up to 12 inches. William J. Clucas, for the last eight years Detroit district sales manager of the Columbia Axle and Shafting Co., has been appointed assistant sales manager.

MacDonald and LaSalle Not Bought by M.E.S.A.

DETROIT—In its issue of May 5, *Automotive Industries* erroneously reported that the M.E.S.A. had bought the MacDonald and LaSalle Tool companies. Both companies deny that such a sale was consummated.

W. J. MacDonald, general manager of the MacDonald Tool Co., states further that the company's shop is not closed to M.E.S.A. members and that no closed shop agreement was signed with the M.E.S.A. The officers of this company, which has recently moved to 6301 E. Lafayette St., due to increased business, include G. A. Rebh, president; Emil J. Heinrich, treasurer; and H. F. Heyer, secretary. None of these officers are in any way connected with the M.E.S.A., Mr. MacDonald says.

R. R. Rhoades, president of LaSalle Tool and Gauge Co., advises *Automotive Industries* that the company's shop is of the cooperative type and owned by workers and management. Mr. Rhoades also states that no closed shop agreement has been made with M.E.S.A.

Automotive Industries regrets any injustice that it may have done to these two companies in publishing a report which it obtained from sources it believed to be reliable.

Popular Models Reduced $15 to $90 By Federal

DETROIT—Price reductions on the popular wheelbase models in the 1½ to 2½-ton lines ranging from $15 to $90 is announced by the Federal Motor Truck Co.

Elect Brown Director

DETROIT—W. P. Brown has been elected a director of the Briggs Manufacturing Co. to succeed J. H. French, who resigned. Mr. Brown also is assistant to W. O. Briggs, president of the company.

GM Opens Nation-Wide Show June 2 in 60 Cities

DETROIT—The nation-wide exhibition of General Motors products, as reported in *Automotive Industries* last week, will be held simultaneously in 60 of the country's most important centers during the week beginning June 2.

The cities in which shows will be held are: Boston, Hartford, New Haven, Providence, Albany, Brooklyn, Buffalo, New York, Rochester, Syracuse, Newark, Atlantic City, Philadelphia, Harrisburg, Pittsburgh, Baltimore, Washington, Louisville, Richmond, Charlotte, Charleston, Atlanta, Birmingham, Nashville, Memphis, Jacksonville, Miami Beach, New Orleans, Toledo, Cleveland, Cincinnati, Dayton, Columbus, Detroit, Grand Rapids, Indianapolis, Chicago, Davenport, Des Moines, Milwaukee, Minneapolis, St. Paul, Omaha, Fargo, St. Louis, Kansas City, Wichita, Oklahoma City, Tulsa, Dallas, Houston, San Antonio, El Paso, Denver, Salt Lake City, San Francisco, Los Angeles, Oakland, Spokane, Seattle and Portland.

D. S. French to Direct Chrysler Chicago Exhibit

DETROIT — Chrysler Corp. has appointed David S. French as general manager of the Chrysler exhibit at The Century of Progress Exposition. Mr. French will be assisted by Russell Dragsdorf, maintenance superintendent, and Roy C. Hayes, publicity director.

A staff of 175 persons will handle the exhibit; in this group will be stunt drivers, painters, cleaners, carpenters, press operators, mechanics and clerical help.

Marmon Share Holders Get New Stock Offer

NEW YORK—Panton and Co. are offering 50,000 class A shares and 500,000 class B shares of the American Automotive Corp. These securities are being offered to debenture and shareholders of the defunct Marmon Motor Car Co. An option for the purchase of Marmon plant and equipment has been received by A. D. Sterner from Marmon receivers.

Details of this option and stock offer were published in *Automotive Industries*, April 28.

Carl Parker Joins Duplex

DETROIT — Andrew Langenbacher, president Duplex Truck Co., Lansing, announces appointment of Carl Parker as sales manager. Mr. Parker is one of the best-known sales executives in the truck field, having served in that capacity with Dodge, Federal, Ford and Reo in the past. Duplex manufactures trucks, mainly to order.

Makers-NADA Progress Toward Formulating Marketing Rules For All Capacity Trucks

ST. LOUIS—Definite progress toward the formulation of marketing rules for trucks of all capacities as a supplement to the Motor Vehicle Retailing Code which now includes only commercial vehicles of ¾-ton or less capacity, was made at a meeting held May 9 at which representatives of truck manufacturers and the National Automobile Dealers' Association were present.

It was agreed at the meeting that trade-in allowances should be based on a depreciation scale, or scales, and that N.A.D.A. should prepare a depreciation chart, or charts, based upon sales records of used commercial vehicles, and also from data to be submitted by the various manufacturers covering sales in the heavy truck group. When this information is compiled, it is to be submitted at a further meeting of the committee to determine the actual depreciation scale, or scales, to be included in the proposed supplementary code.

The N.A.D.A. also is to obtain all necessary data in connection with the building of a catalog listing the chassis, body types and special equipment for all trucks and estimated cost of producing such a manual. The manufacturers are to cooperate by furnishing all available data necessary in this work. This catalog will then be made available to all dealers on a cost basis. The initial expense in connection with producing such a catalog is to be underwritten by the truck makers.

It will be recalled that the truck manufacturers filed a proposed supplement with NRA about the first of March (*Automotive Industries*, March 3). This supplement provided comprehensive depreciation scales to be applied to the new cost of the truck offered in trade, different scales being set up for trucks in the various price classes. This proposal was opposed by the dealer association on the ground that the depreciation rates set up for the lighter trucks were too rapid and because of the difficulties they asserted dealers would face in determining the age and original new prices on heavier trucks offered in trade. Subsequently the proposed supplement was rejected by NRA. It is hoped that the catalog will meet the identification problem, as without such information it might be necessary for the dealer to go to the local dealer selling the particular truck to find its age and original price, which would cause not only delay but in many cases would tip off the prospect.

N.A.D.A. is understood to favor the elimination of all truck allowances from the present Official Used Car Guide and to substitute therefor depreciation scale, or scales, covering all trucks. The N.A.D.A. would prefer to have one depreciation scale to cover all trucks, but admits that a separate scale may be necessary for the heavier trucks. It is not thinking, however, in terms of more than two depreciation scales and apparently believes that if two scales are necessary, one should apply to trucks under three tons or thereabouts, and the other to trucks of more than three tons.

Average Engine Develops 173 Lb. Ft. at Peak Power

THE average 1934 American passenger car model travels one mile for every 3100 revolutions of the engine in high gear, and therefore advances 1.7 ft. per engine revolution. The average engine torque at maximum horsepower is 173 lb.-ft., and the engine therefore develops 1085 ft.-lb. of energy per revolution. At the speed of maximum torque (usually about one-half that of the speed of maximum horsepower), the engine develops about 25 per cent more energy per revolution, or 1350 ft.-lb. This amount of energy is enough to lift a car weighing 3750 lb., with passengers, a distance of 4.32 in. vertically against the force of gravity. On a smooth and level road it takes only about 96 lb.-ft. of energy to move the car 1.7 ft. at low speed. Allowing 10 per cent for loss in the drive, the power factor of the engine when traveling under the conditions mentioned is therefore only about 8 per cent.

MacManus Merges With John-Adams

DETROIT—Theodore MacManus, nationally known advertising executive, has announced he will assume the presidency and active direction of the newly formed agency, MacManus, John and Adams, Inc., with offices in the Fisher Building. The new organization is a consolidation of MacManus, Inc., and the recently organized John-Adams, Inc.

Continuing in executive capacities with the new organization are: E. A. MacManus, John R. MacManus, Louis Ling, W. J. Mattimore, Harvey G. Luce, M. St. John Brenon, R. A. Brewer, Elmer W. Froehlich, Leo A. Hillebrand and William Ingham, all of whom has been associated with Mr. MacManus for a number of years.

Mr. MacManus has been identified with the automotive industry since its earliest days. At various times he has directed such accounts as Cadillac, Hupmobile, Fisher Body, Chrysler, Champion Spark Plugs and Dodge Brothers.

W. A. P. John and James R. Adams, who have been associated with the Campbell-Ewald organization, resigned from that agency recently to form their own company.

Automotive Service Show Display Bids Restricted

CHICAGO—Invitations to exhibit at the Automotive Service Industries Show at Cleveland, November 19-23, are to be restricted to members of the three sponsoring associations, the M.E.M.A., M.E.W.A., and N.S.P.A

Though Cleveland's new Exposition Hall, where the show is to be held, contains 165,000 square feet of display space the exhibition management believes the request for space from member companies will be so great that no room will be left for other industries or organizations.

Electric Auto-Lite Co.

TOLEDO—Electric Auto-Lite Co., reports a net profit of $474,469 for the year ended December 31, 1933, against $1,613,416 for 1932. Total current assets reported at the close of the year were $2,152,745, with total liabilities of $304,040.

Tung-Sol, Inc.

NEWARK — Tung-Sol Lamp Works, Inc., reported a net profit of $163,243 for the year ending December 31, 1933, against a net loss of $100,022 for the previous year. Total current assets at the close of 1933 were $1,402,065 and total liabilities of $340,248 were reported.

Shaler Co.

MILWAUKEE—A net profit of $34,535 for the year ended December 31, 1933, against a deficit of $43,816 for 1932 has been reported by the Shaler Co. Total current assets at the close of 1933 were $394,686 with liabilities totaling $76,229.

Spicer Promotes Fairhurst

TOLEDO—William Fairhurst, who has been sales manager of the Spicer Manufacturing Corp., and associated with the company since 1925, has been promoted to vice-president in charge of sales. Charles A. Dana, president, made the announcement.

OK Plant Mortgages

BUFFALO — Pierce-Arrow stockholders are reported to have approved the proposal permitting the directors to place mortgages on the plant and property of the company to raise funds whenever the need arises.

Automotive Demands For Steel Slacken

Flat Producers Continue Operating 75% Capacity To Meet Industry's Need

NEW YORK—Steel market comment on the extent to which automotive consumers are stocking steel is a case of blowing hot one day and cold the next. Following several weeks of talk to the effect that automotive consumers had bought all the steel they possibly could at the lower prices that prevailed up to about the middle of last month, and were now ordering heavy tonnages shipped, much of it for stocking, the story now making the rounds is that they are not stocking any steel at all.

After all, say those who are spreading this information, the saving entailed would not amount to more than $5 to $10 per unit, offset in part by the interest on the investment and perhaps slightly greater handling costs, and this would hardly be sufficient inducement for stocking on a large scale. Conjectures of this sort fit in with the market's mood this week, influenced by a one-half per cent decline in the rate of operations reported by the American Iron and Steel Institute on Monday.

Although there is every indication that specifications will run relatively heavy between now and the end of the period in which the code permits their acceptance, one hears talk of the high of the movement having been definitely passed. In a few instances, automotive consumers have, for one reason or another, revised their shipping orders downward for the moment, but flat steel producers, on the whole, are working at upward of 75 per cent of capacity, with some having their entire productive set-up fully engaged and the bulk of their output destined for automotive consumption.

The movement of semi-finished steel to mills rolling automobile stock is consistent with the former condition, but the statisticians conveniently overlook the automotive character of this demand. Certain it is that what may turn out to have been nothing more than a temporary recession, and a very mild one at that, has unduly beclouded the sunshine to which the steel market had become accustomed in the past seven weeks.

Pig Iron—Virtually all the business that is passing consists of single carloads and nearly all the buying is for rush shipment. Prices continue unchanged.

Aluminum—The market is a shade more quiet with prices unchanged.

Copper—Demand is light pending further clarifying of the status of "non-Blue Eagle" copper. "Outside" holders refuse to offer metal until they are certain of the limitations imposed upon them by the Code Authority. The "Blue Eagle" price of copper remains unchanged at 8½ cents, delivered Connecticut Valley point.

Tin—Sharp declines on the London Metal Exchange on Monday caused the New York market for spot Straits tin to give way to the extent of a full cent per pound, the week's opening price being 53 cents.

Papa Feasts On Gasoline While Ma Subsists On Air

CHICAGO—Motor car manufacturers have lost an enthusiastic customer—for a time at least—for Judge Walter La Buy has issued an injunction against Otto R. Barth, restraining him from buying any more new automobiles. This injunction, which might be called in restraint of trade, was issued on the plea of Mrs. Barth, who charged that her husband spent so much time and money purchasing new cars and accessories for them that she and five children are starving.

William A. Black

DETROIT—William A. Black, vice-president and general manager of the Automatic Products Co., manufacturers of screw machine products, died last week in Harper Hospital following a short illness. He was 47 years old.

Mr. Black is survived by his widow, his mother, a brother and sister and a half brother.

R. P. Brown Joins Timken

CANTON—Ralph P. Brown, formerly in charge of publicity for the National Lime Association and the Brown Instrument Co., has joined the advertising department of the Timken Roller Bearing Co. and the Timken Steel and Tube Co.

Complete Auto-Lite Moto Meter Merger

Stock Exchange Deadline Effective on 19th; Miniger Retains the Presidency

TOLEDO—Merger negotiations of Electric Auto-Lite Co. and Moto Meter Gauge and Equipment Corp. are complete with the deposit of more than 55 per cent of Moto Meter stock in exchange for Auto-Lite common. March 19 is the deadline for the exchange of stock on the present basis of one share of Auto-Lite for each two and one-half shares of Moto Meter.

C. O. Miniger continues as president of the combined companies, while R. G. Martin, Moto Meter president, becomes a vice-president of Auto-Lite and president of Moto Meter, operating the latter plant as an independent unit. D. H. Kelly has been named Auto-Lite vice-president. New members of the board of directors include Mr. Martin, H. E. Talbott, Jr., Russell McGee, and L. F. Stoll. These four men replace Auto-Lite employees named at the annual meeting to serve until completion of the merger negotiations.

A statement has been issued announcing that the combined sales of the two companies during the first quarter of the current year doubled the sales for the same period of 1933. Net profits are reported to be in the neighborhood of $500,000 as compared with $11,884 for the corresponding three months of last year.

Pontiac's "Graphic" Proof

Pontiac dealers are being equipped with these Ride-O-Graphs to demonstrate to prospective purchasers the easy riding qualities claimed for the car. Each jounce against the inflated cushion makes its mark on the tape in the machine

Business in Brief

Written by the Guaranty Trust Co., New York, exclusively for Automotive Industries

Weather conditions last week were more favorable for business in many sections of the country, and both wholesale and retail trade improved. However, business was retarded in the Middle West and North West by a drought. Industrial activity was generally well maintained.

Car Loadings Drop

Railway freight loadings during the week ended May 5 totaled 604,205 cars, which marks a decrease of 4449 cars below those during the preceding week, an increase of 77,087 cars above those a year ago and an increase of 70,254 cars above those two years ago.

Store Sales Change Little

There was little change in the value of department store sales during April. The preliminary adjusted index of the Federal Reserve Board for April stood at 76, as against 77 for March and 71 for February.

Food Prices Stable

Retail food prices during the two weeks ended April 24, according to the Bureau of Labor Statistics, declined 0.1 per cent. The Bureau's index number showed a decline for the third consecutive two weeks' period, and prices were 107.3 per cent of the 1913 average.

Electric Output Gains

Production of electricity by the electric light and power industry in the United States during the week ended May 5 was 13.7 per cent above that a year ago. This marks the smallest gain above a year ago since the week ended February 17. The decline is attributed to seasonal factors and the introduction of daylight saving time in many communities.

Employment Level Up

New York State factory employment during the month ended April 15 increased 1.4 per cent, while total wage payments rose 1.2 per cent.

Crude Oil Production

Average daily crude oil production for the week ended May 5 amounted to 2,429,500 bbl., as against 2,450,250 bbl. for the preceding week and 2,648,850 bbl. for a year ago.

Fisher's Index

Professor Fisher's Index of wholesale commodity prices for the week ended May 12, stood at 75.2, a new high for this year, as against 74.0 the week before and 73.1 two weeks before.

Federal Reserve Statement

The consolidated statement of the Federal Reserve banks for the week ended May 9 showed decreases of $1,000,000 each in holdings of discounted bills and of bills bought in the open market. Holdings of Government securities remained unchanged.

Self-Adjustment Plan Developed for Labor

National Association's Scheme Would Arbitrate Disputes Within Industry

WASHINGTON—A plan for self-adjustment of labor problems by industry, with provision for arbitration where it is found impossible to compose differences, has been developed by the National Association of Manufacturers.

Under the plan individual employers would attempt to adjust disputes directly with their employees through agencies on which both management and labor would be represented with an impartial chairman holding the balance of power. Where such agencies were unable to effect an agreement, the case would go to an appellate board which would be set up in each coded industry. Management and labor would also have equal representation on this board with an impartial chairman. Failing settlement by this board, the case would be arbitrated by representatives of management and labor with a chairman appointed by the National Recovery Administrator, or in cases of national interest, by the President.

"All grievances and complaints," the Association says, "should be settled in the plant where they originate by direct negotiation between management and men, or their representatives. . . . In the plan suggested for operation within each industry the parties may agree to an impartial arbitrator whenever a dispute remains unsettled in the plant. . . . But usually appeals will be disposed of by the continuing appellate body within industry."

New GM Appointments Announced by Sloan

NEW YORK—Alfred P. Sloan, Jr., president of General Motors Corporation has announced the following appointments effective May 15:

B. D. Kunkle, now president and general manager of the Delco Products Division at Dayton, Ohio, to become assistant to C. E. Wilson, vice-president of General Motors Corporation, with headquarters at Detroit, Michigan. F. H. Prescott, now president and general manager of the Guide Lamp Division at Anderson, Indiana, to become president and general manager of the Delco Products Division at Dayton, Ohio. F. L. Burke, now factory manager of the Guide Lamp Division at Anderson, Indiana, to become president and general manager of that division.

ICC to Hold Hearing On Transporting Explosives

WASHINGTON—Regulations for the transportation of explosives by truck and otherwise and other dangerous commodities will be discussed at a hearing before the Interstate Commerce Commission, June 2, with Director W. P. Bartel presiding.

Under an act of Congress, approved in 1921, the commission is required to formulate regulations for the safe transportation of explosives and other dangerous articles. It is expected such regulations as may be adopted will follow closely the recommendations submitted by the Bureau of Explosives.

Germany Plans Erection Of Liquefaction Plant

WASHINGTON—A plant for the liquefaction by a process originated by Professor Fisher of the Coal Research Institute at Muehlheim, Germany, is to be constructed in the Ruhr district, according to advices received from the Department of Commerce from Acting Commercial Attache Douglas Miller at Berlin.

Preparations for construction of the new plant are already under way, the report says, and the plans call for a large-scale lay-out which will insure a plant capable of producing several thousand tons of gasoline annually.

NRA Dumping "Nuisance" Codes; Internal Movement for Return to Simple Principles

WASHINGTON, May 17—Dumping of "nuisance" codes, definitely announced by General Hugh S. Johnson, is only one of the important changes being made in NRA as it approaches the end of its first year. It is working back toward the original conception of simple codification of industry.

The extent to which it may go in this direction is not known since there is doubt that it has mapped out a specific program. Rather the feeling is that policies are being shaped gradually and adjusted to developments. The general trend, however, is distinctly toward lessening the load of complications and ramifications which have sprung up and woven a tangle around NRA.

Throwing off of the small codes greatly relieves the NRA of heavy burdens, burdens, which General Johnson said have taken 85 per cent of the time, personnel, money and effort of the organization yet covered only 15 per cent of the recovery program.

Wage and Hour Codes

These nuisance or service trade codes cover a wide range of intrastate activities, such as dry cleaning, laundries, barber shops, beauty shops, etc. Then there are many other small industrial codes, such as those covering pig nose rings, mopsticks, corncob pipes, etc., which may also fall by the wayside. The idea is to turn these codes over to the states to be operated under the President's Reemployment Agreement, with the right to display the Blue Eagle. Wages, hours, working conditions, section 7-a (collective bargaining) and a few simple trade practices will cover these codes.

There is indeed a movement even within the NRA itself to turn all codes back to these simple principles; to wipe out lengthy trade practices; to abolish all forms of price control. It was just such a conception that underlay the original principles of the National Industrial Recovery Act in the view of many members of Congress, including some of its principal advocates. With codes stripped to this simple formula there is a question as to whether industry generally would be interested much, if at all, in codification. It is precisely the form in the automobile code, however.

There is an offset to this possible lack of interest in the insistence of many favoring simplification that protection against chiseling must be afforded. This is not to say there is not a school of thought, said to be existent within the NRA itself, that even this barrier should be removed and free rein given to industry to work out its own problem, a view that goes all the way toward self-government. It is a view that some of the New Dealers sniff at as being an Old Deal view. And the Old Dealphobia is still widely prevalent in Washington.

General Johnson frequently joyfully indulges himself in lashing the Old Dealers. Yet he is much more of a realist than the brain trusters and others within the Roosevelt administration who jump on his broad shoulders more violently than do the Old Dealers. The General would have difficulty in proving that "enemies" of the NRA are among the Old Dealers only. The sharpest critics are within. Witness Darrow's board, the AAA, the Federal Trade Commission and other Government organizations less vocal. Nor does there seem to be a Damon-Pythias affection between the Department of Justice and NRA.

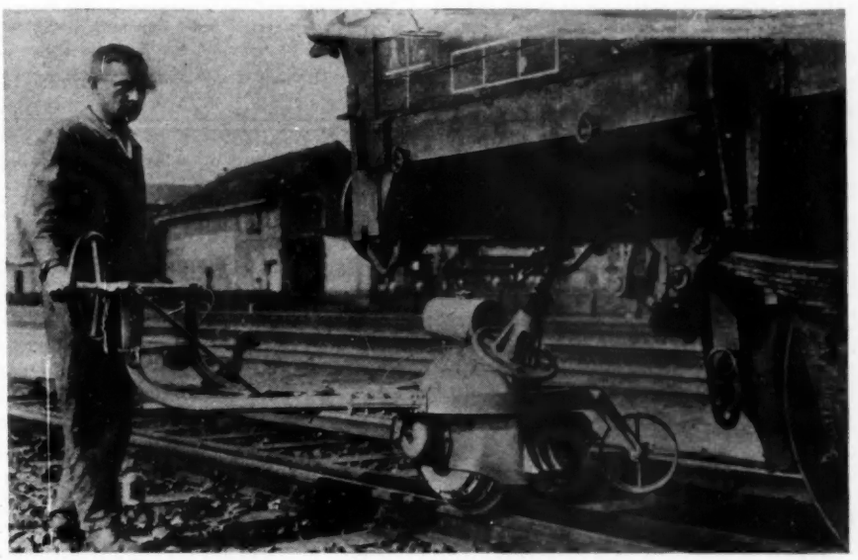
Being well streaked with realism perhaps explains why General Johnson is turning more and more toward the idea of self-government by industry. It may be that his move is stimulated by a realization of the fact that NRA has found itself in dangerously deep water in trying to undertake the gigantic and impossible task of policing all industry of the United States. This having been brought home to him after almost a year of taking on burdens that but few men could possibly carry probably accounts for the unloading of nuisance codes, with withdrawing of "crack down" ideas, the declaration that NRA cannot be enforced with penalties and policemen, and the move to have industry take over to a greater degree the job of self-government. While there are, as might be expected of a mercurial temperament, inconsistencies in the General's statements and policies, the drift appears toward greater recognition of natural forces that industry itself must deal with, and with better results than can come from a governmental bureaucracy.

It is not expected, however, that NRA under General Johnson's guidance will go all the way with either those urging virtually widespread lifting of control over industry or those who want it tightened. He has criticized sections of industry for wanting to eat their cake and still have it. He is not in favor of letting industry pick what it wants from NRA and throwing overboard what he considers are the rights of labor, though he wants industry to handle its own labor problems to a greater degree than it now does. At the same time the General will continue to strike out at critics who assail NRA as oppressing small enterprises, promoting monopoly, and other alleged offenses with which it has been charged by Darrow's board and the Federal Trade Commission in particular.

Chevrolet to Assemble 20 Cars Daily at Fair

DETROIT—The actual building of automobiles on the Chevrolet assembly line in the General Motors building at A Century of Progress—The Chicago World's Fair—will begin May 15, according to an announcement made here today by Dudley Frazer, production manager of the line. The assembly line will operate daily, except Sunday, from 1.30 P. M. to 5 P. M. and 6.30 P. M. to 9 P. M. each day.

Coaches and four-door sedans of the "knee-action" Master Six line will be assembled this year Present plans call for approximately 20 cars to be turned out each day. More than 200 employees will be engaged in building these cars, it was stated.



For pushing, not for putsching, this German application of the internal combustion engine is designed to make spotting freight cars a one man job. The six-horsepower two cycle power unit exerts its push against the rail through a pneumatic tired wheel

Steel Code Revisions May Give Car Makers Quantity Price Differentials

WASHINGTON — Establishment of Detroit as a basing point for sheets, strips and bars, and restoration of quantity price differentials, are among the revisions of particular importance to automobile manufacturers which may be made in the Steel Code when it comes up for renewal on May 31.

While General Johnson said some time ago that the Steel Code would be "slightly amended and extended" at the end of this month, it is now understood that the General has returned to a former view that some important changes should be made in the code. The assumption is that one will relate to basing points, and it is a question as to whether NRA and the steel industry are in agreement on the subject which is now being negotiated along with other phases of the code. However, it is regarded as certain that the Federal Trade Commission view that steel should be sold F.O.B. mill is not even being considered. Instead, it is felt that the number of basing points will be broadened with Detroit among the additions for certain classifications.

Although NRA has declined to make an announcement of proposed changes, another revision which is expected to be made relates to the filing of prices. It is believed that the waiting period will be eliminated since NRA some months ago adopted the policy of requiring that prices become effective immediately upon filing.

In view of remarks made by NRA General Counsel Richberg in a speech last week, there is no reason to believe that NRA contemplates the elimination from codes of provisions designed to protect industry against predatory and destructive price-cutting. Consequently, it appears that the steel and other codes will continue to have this feature.

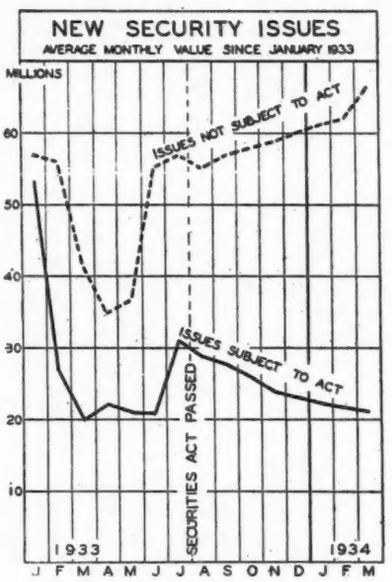
In his speech, Mr. Richberg said that both price and wage fixing were bad medicine, and then went on record in favor of both so long as competitive conditions prevail which tend to force them below levels that are economically sound in the case of the former and socially just in the case of the latter. Ultimately, he said, hours and wages should be settled by honest collective bargaining while prices should be determined by competition.

Midgely Gets ACS Post

NEW YORK—Thomas Midgely, Jr., vice-president of Ethyl Gasoline Corp., has been elected chairman of the board of directors of the American Chemical Society.

A Swiss Plymouth

DETROIT—It is reported from reliable sources that negotiations have been completed for the assembly of Plymouth cars in Switzerland by the Saurer Company. Saurer heretofore has been engaged largely in the manufacture of heavy duty trucks.



"The clear fact is that the flow of new capital into enterprise has almost ceased, and the evidence strongly indicates that the Federal Securities Act is an important factor contributing to the stoppage and so is retarding recovery and restricting reemployment."—Col. Leonard P. Ayres in the Business Bulletin of the Cleveland Trust Co.

Equipment Companies Join Ford Exposition Display

CHICAGO—Plans for the Ford Motor Co. display at the Century of Progress Exposition this year continue to grow. More than 20 companies supplying materials, parts and accessories to the Ford company have recently signed contracts to participate. With these displays it is estimated that the Ford Building and exhibits it contains will represent an investment of about $2,000,000.

Among the companies which will participate in the Ford exhibit are the Bendix Products Corp., Briggs Manufacturing Co., Champion Spark Plug Co., Detroit Gasket Manufacturing Co., Houdaille - Hershey Corp., Kelsey - Hayes Wheel Co., Motor Products Corp., Murray Corp. of America, Stewart-Warner-Alemite Corp., Thompson Products, Inc., Timken-Detroit Axle Co., and U.S. Rubber Co.

Gasoline Consumption Up 10% in February

NEW YORK—February gasoline consumption was up 10 per cent from February, 1933, but down 10 per cent from January, 1934. The decrease from January was about in proportion to the smaller number of days in February so that the daily average consumption in both months was approximately the same. In the first two months consumption ran 10 per cent ahead of the similar period last year.

Mr. and Mrs. Ford Hosts At Good Will Day Program

DETROIT—Mr. and Mrs. Henry Ford will be hosts at the annual Good Will Day celebration at Greenfield Village, May 20. Actors in costumes representing 52 nations will take part in the spectacle.

The celebration commemorates the initial gathering of the nations at the first Hague conference, May 18, 1899, to devise a peaceful means for settlement of differences.

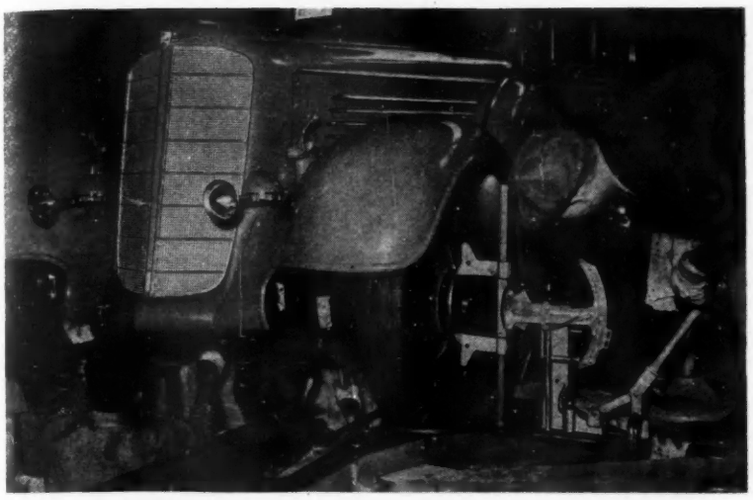
R. E. Wilkin to Head SO Automotive Department

CHICAGO—R. E. Wilkin has been appointed manager of the automotive engineering department and assistant manager of the technical department of the Standard Oil Co. of Indiana, according to an announcement this week. H. J. Saladin was named manager of the technical department.

The automotive engineering department under Mr. Wilkin's direction will permit the enlargement of the automotive activities which have been previously handled by the technical division, and will include contacts with the manufacturers of automobiles.

Ethyl Gas Enlarges Equipment In Its Detroit Laboratory

DETROIT—Dynamometer equipment in the laboratory of the Ethyl Gasoline has been modernized to keep up with the increase in horse power of automobile engines. Larger exhaust lines have been installed and radiator and control equipment improved. The new equipment permits of testing engines of 300 hp. at speeds up to 6,000 r.p.m. New air-compressor equipment will supercharge to 30 lb. per sq. in. above atmospheric pressure any engine likely to be built during the next few years, the company announces.



End of the Buick line where front-end crew makes final adjustments of camber and caster. New inspection devices shown in close-up at the right have met the problem of front end alignment on knee action models

Canadian Police Taboo Smoke-Screen Devices

OTTAWA, ONT. — Canada's famed Mounted Police needed help, and got it from the Department of National Revenue.

The famous red-coats found their anti-smuggling activities hampered by smoke-screen apparatus attached to automobiles and gasoline launches. Such a device allowed law-breakers to escape or carry on their illegal business. The police reasoned that no citizens engaged in lawful business had need for such an apparatus.

An appeal was made to prohibit the importation of such devices, and the Department of National Revenue promptly put such machinations on the taboo list.

John Carr Woodison

DETROIT—John Carr Woodison, president and general manager of E. J. Woodison Co., manufacturers of foundry supplies, died Friday, May 11, following a brief illness. He was 53 years old.

Mr. Woodison also was vice-president of the Canadian Foundry Supplies Co. of Montreal, and vice-president of the M. A. Bell Co. of St. Louis. He is survived by his widow, two sons, and a sister.

$3 "For Hire" Truck Fee OK'd by Johnson

Administrator Suspends "Not-for-Hire" Charge; Up to Code Authorities

WASHINGTON—An assessment of $3 on each "for-hire" vehicle to defray the expenses of the Trucking Code Authority, has been approved by National Recovery Administrator Johnson. At the same time, General Johnson stayed the registration of "not-for-hire" vehicles by the Trucking Code Authority and suspended indefinitely the proposed registration fee of 90 cents per vehicle.

The 90-cent fee was the subject of vigorous protests from "not-for-hire" operators at the public hearing on the assessment plan, and final determination of the issue will now await the outcome of conferences with the Code Authorities of the affected industries.

The budget submitted by the Trucking Code Authority is based on $3 from 425,000 "for-hire" vehicles, making a total income of $1,275,000 against estimated expenses of $1,714,158 for the national Code Authority, 12 regional and 50 state code administrative agencies. The deficit, it is hoped, will be made up by economies in operation.

The national Code Authority will have 55 employees with a payroll of $134,400 annually. State administration payrolls are budgeted to total $346,118 with regional administrative expense at $186,000.

Lansing Employment Rolls Near '29 Level

LANSING — Oldsmobile and Fisher Body plants are principally responsible for a big employment gain in this city. More than 7,000 persons are engaged in the two General Motors factories. The Motor Wheel Corp., accounts for 2,750 more workers. These three plants are operating on a 24-hour schedule. The Reo Motor Car Co. is employing more than 2,500 workers at the present time.

Highway History Told By 19 Roads, Feature of Ford's Chicago Fair Exhibit

CHICAGO—Highway history from the earliest Damascus days to the present era, graphically told by sections of the world's 19 most famous roads, will form an important part of the Ford Motor Company's exhibit this summer at the Century of Progress Exposition.

The romance of these roads has been envisioned and they will be duplicated in as close detail as science permits. Visitors to the exhibit will be afforded an opportunity to ride over each of the 19 sections and compare the comforts of road travel from pre-Christian times to our own day.

The sections of road to be constructed at the Ford exhibit are:

Imperial Road of China—stones of all shapes and sizes, badly spaced and slippery in wet weather; Walting Street—ancient English road built across southern England in pre-Roman days; Belgian Block Road—the most durable of all, introduced in the 17th century; Grand Trunk Road of India—includes Khyber Pass, natural dirt road pounded hard by feet of men and animals; The Street Called Straight — in Damascus, the world's oldest town, made of stone and gravel; Canadian Plank Road—introduced in Toronto about 1835, heavy planks laid on stringers set in ground and covered with a blanket of sand or dirt; Typical Gravel Road—one of the earliest examples of modern hard-surfaced highways; La Grande Corniche—military road started in 1806 by Napoleon I with a view to invasion of Italy; Kleinpflaster Pavement—German road made of broken rocks; The Appian Way—begun by Appius Claudius in 312 B.C., running from Rome to Brindisi; Lancaster Pike—first metalled road in United States; Modern Concrete Road—typical new motor road in general use throughout this country; Wood Block Road—originated in Eastern Europe; Antioch-Bagdad Road—section of a Roman road once used by Caesar's legions; Early Brick Road—used extensively throughout Ohio; Great Caravan Route—beaten track across the Sahara desert, lined with the bones of millions of dead animals, bleached and preserved by the desert sun; Cobble Stone Paving—introduced into Mexico by the Conquistadores; Wilderness Road—the trail blazed by Daniel Boone into Kentucky; Route de Quarante Sous—the highway from Paris to Deauville, started in 1854; this is the first road on which rock asphalt was used as a binding medium.

Fisher Strikers Agree

(*Continued from page* 601)

has seriously interfered with assembly and shipment of the new Buick 40's.

This latest development in the automotive labor situation emphasizes the harmful effects controversies in Washington over interpretation of Section 7a of NIRA are having upon industry.

Oppose Settlement Principles

One of the more important and significant facts growing out of the Fisher strike is the refusal on the part of A. F. of L. leaders to enter conferences with the Fisher management if representatives of the so-called Fisher "company unions" are present. This action is tantamount to a four-square refusal to abide by the principles of collective bargaining enunciated by President Roosevelt in his settlement of the threatened general automotive strike sometime ago.

The President's ruling, it will be recalled, provided for the setting up of bargaining committees with proportionate representation of both majority and minority groups. The Automobile Labor Board, headed by Dr. Leo Wolman, has consistently followed that recommendation in all its suggestions to labor within the industry. General Johnson has given it additional force by his public endorsement.

It is the insistent contravention of this principle by Senator Wagner's National Labor Board which is inspiring A. F. of L. leadership to take the stand that it has. In practically all matters coming before it for settlement the N.L.B. has ruled for majority control of collective bargaining, and A. F. of L. claims majority representation in Fisher No. 1 plant.

Automotive Industries has repeatedly pointed to this anomalous situation and the present Fisher situation serves only to emphasize its importance. There are now two distinct schools of thought. In the one group are President Roosevelt, the automotive manufacturers, General Johnson, and the Automobile Labor Board. Opposing them are Senator Wagner, the National Labor Board, and the American Federation of Labor. And since Dr. Wolman's group now has complete jurisdiction over the entire automotive field it occasions no surprise when the Federation's Mr. Green and some of his lieutenants arraign themselves against and continue their attacks upon the Wolman board.

It is rather well known that Richard E. Byrd, labor representative on the Board, does not have the sympathy of the entire Federation, although he is an A. F. of L. man. Byrd has the reputation of being somewhat of an idealist and rather evidently has shown that he has not always been in entire accord with policies of the A. F. of L.

Fisher Flays Tactics of Union Leadership

FLINT—A sweeping denial that the company had cut piece rates, that it had discharged any employee for protesting against existing rates and that it had refused to bargain collectively with duly accredited representatives of its employees, was made in a public statement issued here by Fisher Body on May 12, in connection with the dispute which developed at its No. 1 plant late last week.

"When the new Buick 40 Series was planned," the statement said, "it was realized that certain necessary equipment and other facilities for the production of bodies of the new type were not available in the Flint unit.

"Rather than take the job out of Flint, . . . we immediately ordered and made available the necessary equipment and facilities. To do this, it was necessary for us to make an investment of $60,000.

"And since this is a smaller car than had heretofore been produced in the Flint unit, with a corresponding reduction in the time required on many operations, reduced operating costs naturally were to be expected.

Workers Agreed to Rates

"Consequently a series of meetings was held with all employees who would be engaged on the new work; a thorough study of each operation was made; these operations, together with the rates which would apply, and the earnings to be expected, were fully discussed. Each man in the Flint unit agreed, either directly or through representation, to the rates decided upon. In brief, our employees collectively bargained for, and agreed to accept, the prices then established in order to keep this job here in Flint.

"Labor leaders, having had no part in these discussions or the decision which resulted therefrom, immediately attempted to retard production. Small groups of employees were persuaded to sit down pending adjustment of prices. In each instance these employees after conferring with the plant manager and discussing the situation fully, returned to their work.

"The last of these sit down delays occurred Wednesday, May 9, when a group of 23 men left the plant, necessitating the closing of several departments until these men could be replaced.

Discrimination Denied

"The following day a majority returned. Thirteen men had been interviewed and had returned to work. Six additional men were in conference with the plant manager. While this was taking place, leaders of the American Federation of Labor Local met groups of men outside the plant and claimed that the 23 who had refused to work had been discharged and were being discriminated against."

Following the denial of the charges levied against it, as previously outlined, the statement continued that average earnings of employees in other units engaged in operations identical with those being performed on the new work in the Flint unit for the week ending April 21 were 91 cents per hr. "Every week this plant is closed more than 5000 workers in Flint are deprived of approximately $175,000 in wages," the company concluded.

CALENDAR OF COMING EVENTS

SHOWS

American Transit Assoc., Cleveland, Ohio ..... Sept. 22-27
Cleveland (Automotive Service Industries) ..... Nov. 19-23

MEETINGS

American Petroleum Institute, Pittsburgh ..... May 22-24
National Street and Highway Safety Conference, Washington D. C. May 23-25
S.A.E. Summer Meeting, Saranac Lake, N. Y. ..... June 17-22
American Society for Testing Materials, Atlantic City, N. J. ..... June 25-29
American Chemical Society, Cleveland, Ohio ..... Sept. 10-14
American Welding Society, New York City ..... Oct. 1-5

RACES

Indianapolis ..... May 30

ANNUAL MEETINGS

Natl. Automobile Chamber of Commerce, New York, N. Y. ..... June 7
American Electro Platers Soc., Detroit June 11-14
Natl. Assoc. of Motor Bus Operators, Cleveland ..... Sept. 21-22
Natl. Safety Council, Cleveland, O., Oct. 1-5

CONVENTIONS

National Machine Tool Builders Assoc., Chicago ..... May 24-25
American Society for Metals, New York City ..... Oct. 1-5
American Transit Assoc., Cleveland Sept. 24-27
International Foundry Congress, Philadelphia ..... Oct. 22-26
American Foundrymen's Assoc., Philadelphia ..... Oct. 22-26
National Foreign Trade Council, New York ..... Oct. 31-Nov. 2

EXPOSITION

Natl. Exposition of Power & Mechanical Engineering (Biennial) New York, N. Y. ..... Dec. 3-8

Relay Motors Receiver Asks Court Allow Sale

LIMA, OHIO—The U. S. District Court for the Northern District of Ohio, on June 5 will hear the petition of Grant Gilam, receiver of Relay Motors Corp., for permission to sell the corporation's assets and property to J. G. Wray of Chicago, and E. F. Harsch of Warsaw, Ind., for $750,000. The hearing will be held in Chicago.

JUST AMONG OURSELVES

Ask 'em to Drive To Boost Sales

IT would be interesting to know how many of the 24,000,000 car owners in the United States actually have driven any 1934 model automobile; how many actually have driven a 1933 model; and how many have driven even a 1932 model.

An important factory sales executive expressed the conviction to us that there are millions of owners of old cars who never have driven an up-to-date automobile; who have never experienced what driving a modern car is like.

Probably he is right. Emphasis on demonstration as a retail sales tool is long since trite, but still as much needed as ever. Unless an emotional desire supplements the reasoned thinking of an ordinary car owner it takes a long time to convert him from a user into a prospect.

This particular sales executive thinks that the industry in the future will have to do much more than in the past in taking the merchandise to the customer. He claims to have obtained profitable results from a direct mail campaign offering new cars to picked owners for several days trial, assuring them that they would not be solicited to buy. One such effort, we understand, brought an acceptance of the offer from 65 per cent of those approached and brought immediate sales, without the car ever being turned back, from about 4 per cent. In no case was there any formal demonstration. The keys simply were turned over to the prospect.

* * *

The New Tax Law and Subsidiaries

UNDER the new Federal income tax law, as we understand it, individual units of large corporations, such as General Motors, will have to pay an income tax on profits, even though the consolidated returns for the holding corporation might show a loss. Should the individual unit show a loss, on the other hand, its loss cannot be deducted from profits of other units in determining the taxable income of the holding corporation.

If this provision turns out to be a permanent part of our tax laws, it probably will bring about considerable change in the corporate structure of more than one large automotive organization. Immediate changes would seem unlikely, however, because details of the law have a habit of changing from year to year.

Coupled with the provisions compelling publicity as regards the *amount of taxes* paid and with the power of the President to make public at his discretion the *amount of income* on which the taxes were paid, this new provision may give to the automotive industry as a whole next year its first specific information about the earnings of individual units of several of our largest corporations.

Profiteering and Prices

BEFORE NRA got under way, prices in some industries definitely were below-cost prices. Most NRA codes contain a prohibition against selling below cost.

Some increases were necessary, therefore, to bring prices above pre-NRA costs.

Then, in addition, have come the added costs born of NRA itself—for which additional price increases were necessary.

While some manufacturing groups probably have taken advantage of NRA to fix prices to the detriment of consumers, this double-barrelled impetus to higher prices may offer justification in some instances where boosts otherwise might have been considered excessive.

* * *

British Tax Slash Opens Export Markets

BRITISH automobile manufacturers finally have a chance to build cars for home use which will be more suitable than in the past to conditions in the British colonies. The British tax has been reduced from £1 to 15 shillings per horsepower. The high hp. tax, naturally, has driven British makers to production of small-engined cars not as well suited to the poorer roads and rougher terrain of various export markets.

Just how potent the reduced domestic tax will be in permitting designs better suited for competition in export remains to be seen. At present rates of exchange, a Britisher would still have to pay a hp. tax of about $115 per year on a Ford V-8. While $115 is considerably less than the $150-odd previously required, the sum seems still to be high enough to hold engine sizes on volume-produced British cars well below normal American standards.—N. G. S.

BIGGER CARS for LESS MONEY

For cars of the same weight, the public now pays but little more than half of the 1928 price

IN most lines of manufacture selling prices increase with the size of the articles produced, as represented by their weight, but not quite as rapidly as the weight. For instance, one would not expect to pay quite as much per pound for a 10-hp. electric motor as for a 5 hp. This relationship, however, does not hold for passenger automobiles. With the latter the sales price, instead of increasing less rapidly than the weight, increases far more rapidly. This statement, of course, must be taken as applying to passenger-car prices generally and not as implying that of any two cars the heavier one is necessarily the highest priced. Generally speaking, the prices of cars vary more rapidly than the squares of their weights.

There are two reasons for the fact that the larger cars cost much more per pound than the smaller ones. One of these is that the larger models usually are also the most luxurious ones; the other, that the larger cars are manufactured in smaller numbers, usually with equipment less highly developed from the cost-reduction standpoint, so that their manufacturing cost per unit of weight is far greater.

The figures given in the table herewith apply to list prices of stock cars with standard 5-passenger sedan bodies. Price and weight figures were taken from published lists; prices within narrow weight ranges (200 lb. for the most part) were averaged, the weights of the car within these ranges also were averaged, and the resulting average price then was interpolated to correspond to the nearest round figure for weight (2100 lb., 2300 lb., etc) In this way, average prices were obtained for all of the weight standards for the years 1928, 1930, 1932 and 1934. Strictly speaking, the prices given do not apply to the calendar years, but to the periods during which models designated as those of a particular year were sold. Thus the prices given for 1930, for instance, are the average prices current during the period extending roughly from July 1, 1929, to June 30, 1930.

In many cases, of course, there were changes in prices in the course of the year, and this is properly taken account of in the table, which is based not simply on the prices quoted when the models were announced at the beginning of the season, but on the prices on the particular models throughout the season.

It will be noted that for the first three years the price figures start for car weights of 2300 lb., which was substantially the weight of sedan models of popular-priced cars up to a few years ago. This year there are two cars which are somewhat lighter than this, the Continental and the Willys Four. Then there is a gap in the weight range extending to over 2600 lb., and there are only three cars in the 2600-2799 lb. range. The reason is that all of the popular-priced cars of the earlier period have been replaced by models that are considerably heavier. Thus the Ford four-

PUBLIC pressure for more legroom, faster acceleration and the general benefits that stiffer construction provide, has forced car weights steadily upward during the last half-dozen years. Due to declining basic costs and in the face of reduced production, the industry, however, has been able to maintain a rather consistent downward trend in prices during most of this period.

From the value standpoint, the record is one that the industry can be proud of, as the accompanying article, which analyzes what has happened, demonstrates. On a price per pound basis, for cars of the same weight, the public does not have to pay in 1934 much more than half what it was charged in 1928.

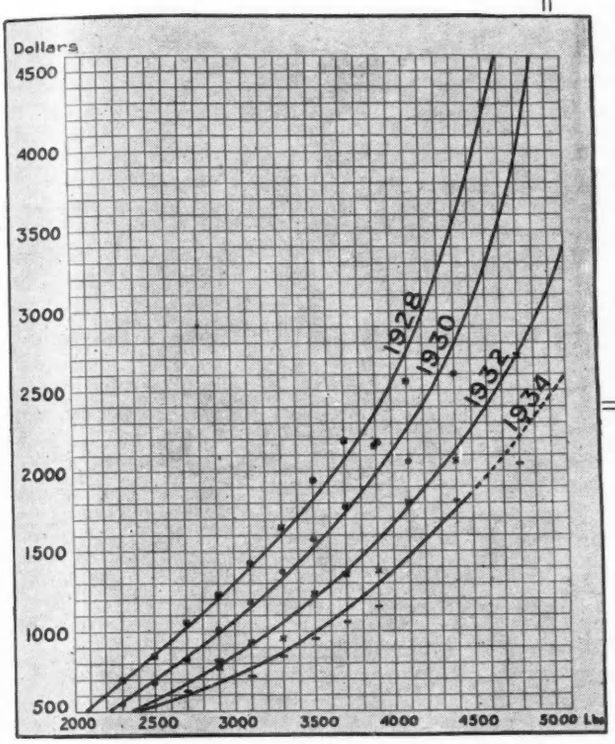
But the public does not buy cars on the per pound basis. With costs again tending upward rather strongly, a question arises as to whether the industry may not be faced soon with the problem of providing cars that will still give the public what it wants and at the same time reduce the weight.

While weight, of course, is not the only criterion of cost, it is a highly important element. Consequently, if the current upward trend in costs continues and is combined with further increases in weight, selling prices may have to go up faster in general than either of these two items. Increasing production may provide an offset, but it may still be necessary to put more emphasis on weight reduction in the future than it has in the recent past.

by P. M. Heldt
Engineering Editor, Automotive Industries

Prices of Cars of the Same Weight Have Been Decreased Drastically Since 1928

Weight	1928	1930	1932	1934
2,100	....	....	....	440
2,300	693	548	495	....
2,500	846	686	540	....
2,700	1,056	834	664	615
2,900	1,215	1,005	784	800
3,100	1,415	1,172	933	715
3,300	1,640	1,366	950	847
3,500	1,930	1,561	1,223	952
3,700	2,195	1,777	1,360	1,062
3,900	2,150	2,168	1,375	1,160
4,100	2,550	2,060	1,800	....
4,400	3,540	2,605	2,070	1,810
4,800	4,960	4,660	2,710	2,052
5,200	6,100	4,940	4,000	....



Generalized curves showing the relation between list price and car weight in alternate years since 1928

cylinder two-door sedan of 1928 weighed 2340 lb. while the Ford eight-cylinder of 1934 weighs 2621 lb.; the Chevrolet 5-pass. sedan of 1928 weighed 2435 lb., the 1934 Chevrolet weighs 3080 lb., and the Chrysler Four of 1928 with sedan body weighed 2300 lb. while its successor, the Plymouth Six, with two-door 5-passenger sedan body, weighs 2608 lb. The change in the price picture as here presented therefore is due not entirely to price reductions but in part also to weight increases. It seems like an anomaly that cars intended for the masses should have "taken on weight" during the depression.

The great reduction in automobile prices since 1928 as reflected by the table is most striking. In this connection it should be pointed out that the figures for the higher-priced classes for 1934 have not the same firm foundation as the others, because not nearly all of the weight figures are in, and figures for higher-priced models particularly are missing. It will be seen, however, that on the average, prices have been nearly cut in half. In two weight classes the reduction was even greater than 50 per cent.

These price reductions were achieved in the face of decreasing production, which makes them all the more creditable to the industry. They were made possible by improved methods and by reductions in material and labor costs. The decrease in the cost of raw materials during the depression period was one of the factors which induced manufacturers of popular-priced cars to increase the size and weight of their cars. With the demand declining, additional inducements had to be offered to purchasers, and with raw materials so cheap it seemed to many concerns preferable to make their cars "bigger and better" than to reduce prices. But as the depression dragged on, price reductions had to follow weight increases.

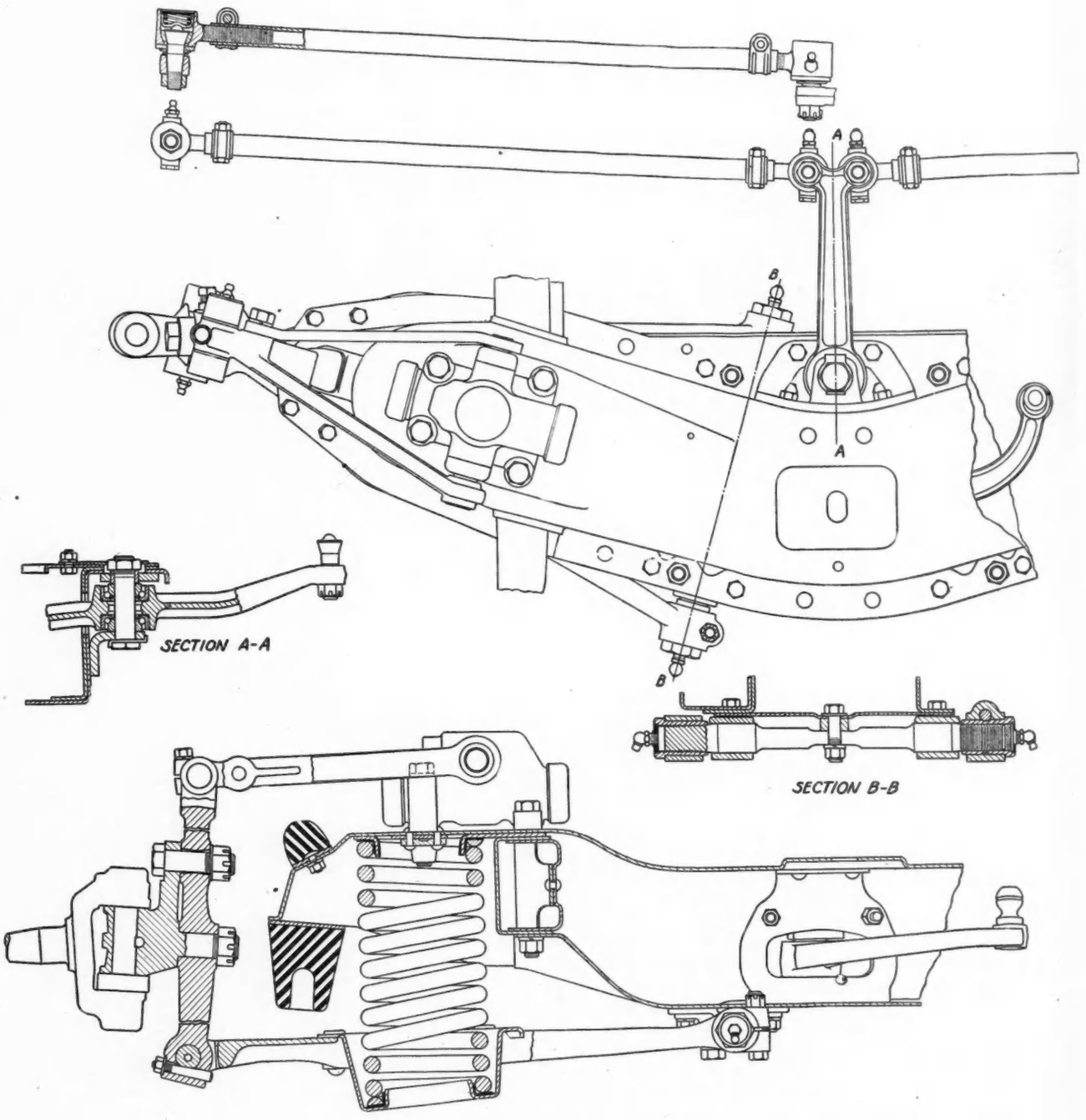
The period of decreasing material and labor costs is definitely past; in fact, both material and labor already are going up. Several makers announced increased prices at the beginning of the 1934 season, and this is reflected by a higher average price for the 2900-lb. class in 1934 than in 1932. There have been a number of additional moderate increases recently.

The interesting question now is whether the popular-priced, quantity-production model for the American market will remain close to the 3,000 lb. mark or whether its weight will recede again. There is no doubt that the increase in size, weight, comfort, and all-around quality of the popular-priced models during the depression period was instrumental in swinging a good deal of business from the medium-priced into the lower-priced field, and in making the "sledding" particularly hard in the medium-priced field. With the return of prosperity there will come another readjustment. Manufacturers in the medium and higher priced branches of the industry will bring out smaller and somewhat less pretentious models, and, on the other hand, a good many of those who purchased low-priced cars during the preceding years of plenty, will again raise their standard of living and will be lost as prospects for popular-priced productions.

There is considerable likelihood that this coming readjustment will be marked by a tendency to lower the weight and size of the popular-priced

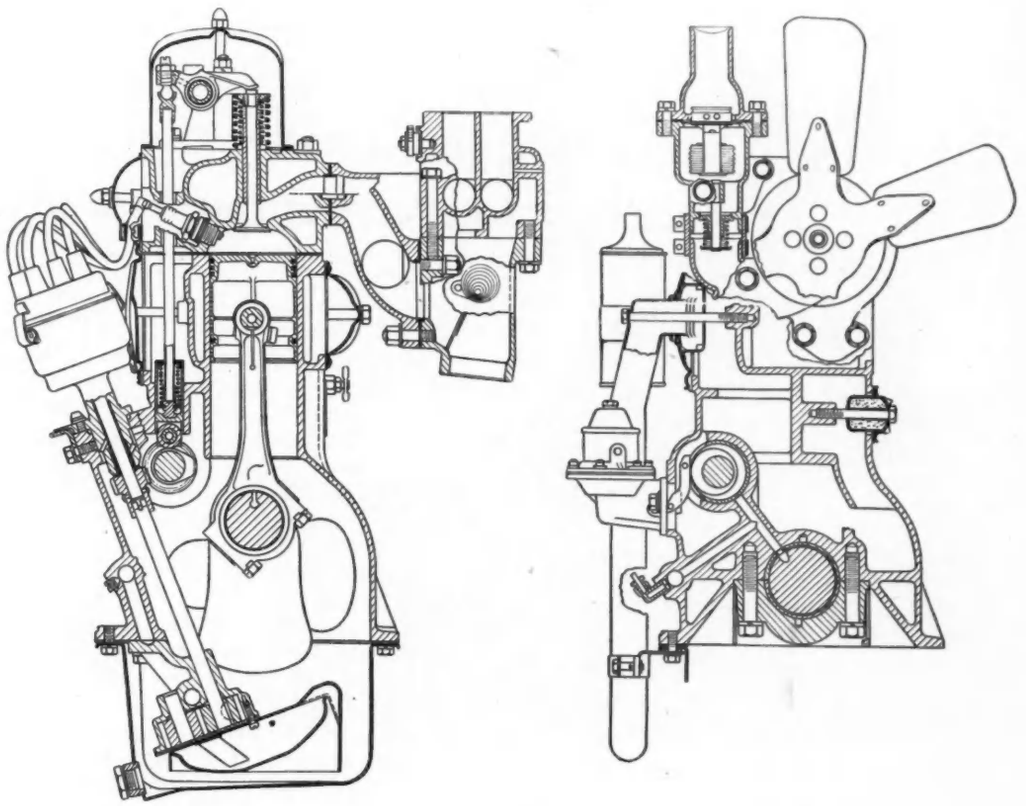
(*Turn to page 625, please*)

Drawings Reveal Design Details

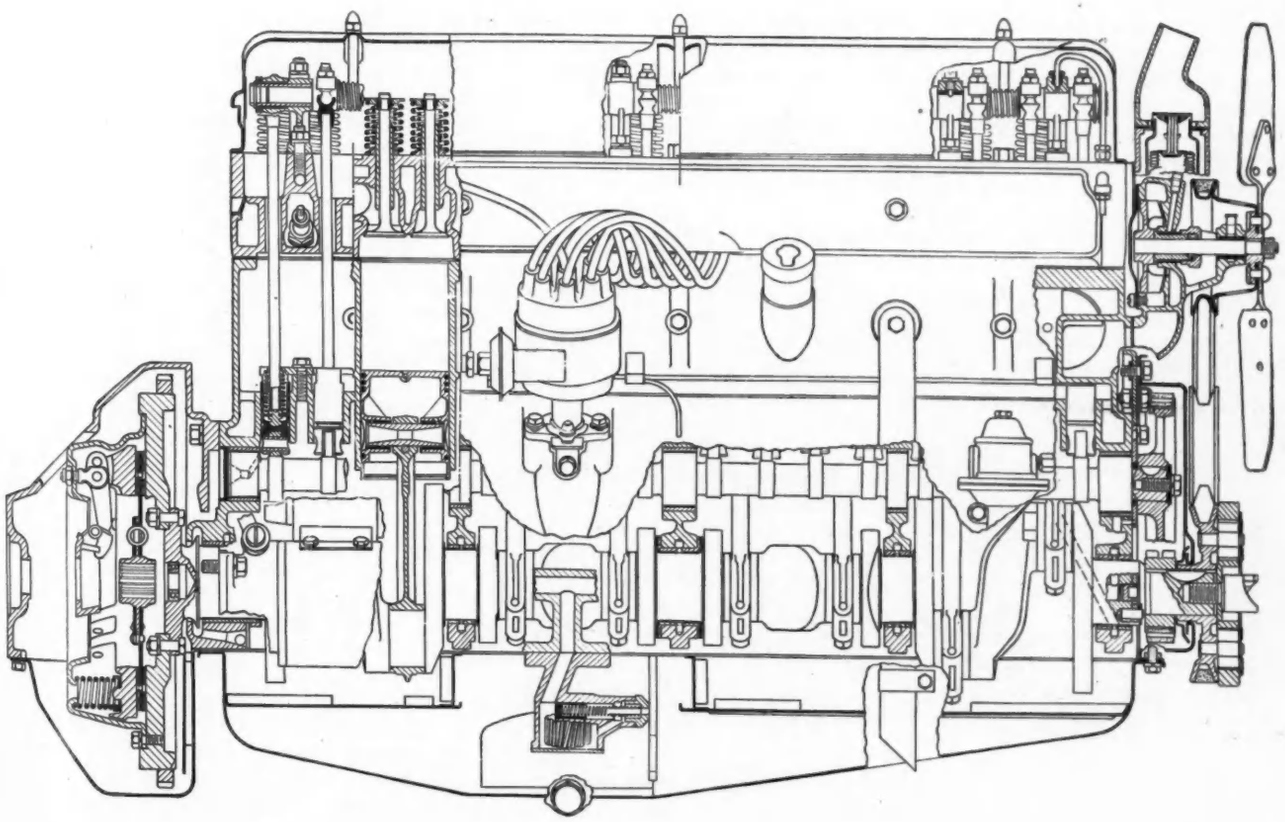


The several views above show the front independent springing of the new Buick Series 40. Changes from the original design of the Buick independent front suspension are that the wishbone links are pivoted directly to the frame cross member instead of to a pressing secured to the frame; that the rubber bumper is located outside of instead of within the coil spring, and that the steering head, that is, the member joining the outer ends of the two wishbone links, is simplified

of the New Buick Series 40 Line



Assembly drawings of Buick Series 40 engine. The longitudinal view shows the chain drive for the camshaft, while the cross sections show the connecting-rod head split at a 45-deg. angle, and details of the lubricating and crankcase ventilating systems



Leaf Spring Institute Designs

Transverse spring construction said to reduce both total and unsprung weights

DETAILS of an independent springing design developed cooperatively by the Leaf Spring Institute of the Automotive Parts and Equipment Manufacturers Association have now been released for publication. Representing probably the first instance in which a group of competitive companies within the automotive industry have cooperatively developed a basic design for the benefit of the industry, the system is of the transverse leaf spring and arm parallelogram type.

It differs in basic concept from the parallelogram type of suspension used on a number of 1934 cars in that two leaf springs, side by side, are substituted for the lower wishbone arms, and the coil spring eliminated.

The Institute was one of the first to be set up under the APEM code last fall and began functioning under the direction of John H. Shoemaker, formerly vice-president of the Gabriel Company of Cleveland, and now the Institute's code commissioner. Mr. Shoemaker immediately proceeded to set up an engineering committee which was charged with the developing of data and doing research work for the benefit of the entire membership of the Institute—in addition to the individual research work conducted by the various member companies.

The committee immediately plunged into the problem of independent springing, checking into known devices, analyzing submitted patents. Contacts were also established for the accumulation of data, with car owners, dealers, car factories, of course, and particularly service men.

The problem set up as the objective of the committee was a suspension which, in comparison with designs being considered, would give:

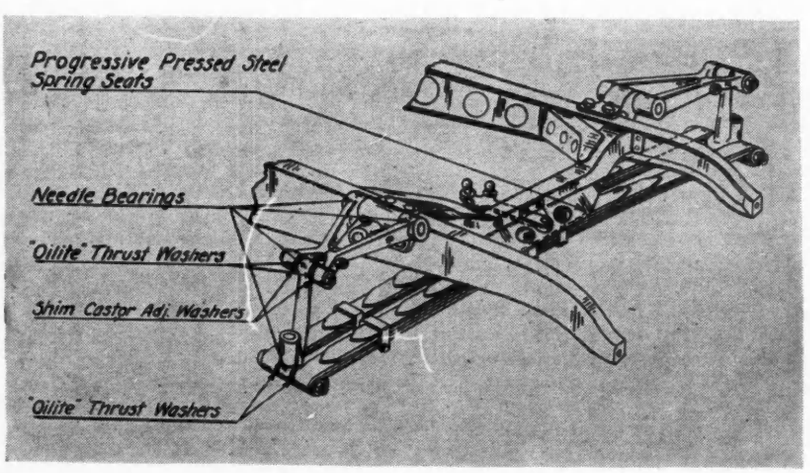
1. Decreased weight unit per car.
2. Decreased weight per car.
3. Less manufacturing and assembly complications.
4. Decreased cost per car.
5. Decreased service problems.

Of the various designs investigated, a system which had been under development by the Logan Gear Company (*Automotive Industries* understands) was selected as offering the greatest immediate promise for the purpose of demonstrating certain characteristics. One of the problems faced by leaf spring producers, of course, has been the statements made by a number of engineers, who had been active in car plants in designing independent suspensions of coil spring type, that leaf springs could not be used.

The first installation of the developed suspension system was made on a Plymouth six, merely replacing the necessary parts of the front suspension in order to effect as few changes in general car structure as possible, for comparison purposes. In the original installation therefore no attempt was made to obtain the maximum advantage obtainable in the way of riding qualities by a complete consideration of the entire car suspension.

The car is being shown and demonstrated to all interested parties particularly at the various car plants.

As to the suspension itself, the accompanying illustration gives the major details of the simple construction employed. It might be noted that spring eyes are double wrapped for additional safety factor. Spring oscillation periods designed into the suspension were around 70 to 80 cycles



The Leaf Spring Institute Suspension is of the transverse spring and arm parallelogram type

Independent Front Suspension

by Athel F. Denham
Detroit Editor, Automotive Industries

John. H. Shoemaker, code commissioner of the Leaf Spring Institute, whose members developed the design cooperatively

per minute in the normal spring position. Spring stiffness, however, is designed to increase progressively with deflection through the use of progressive pressed steel spring seats which progressively shorten the effective length of the springs under deflection, as is done in heavy duty truck design in some instances. The reason, of course, is to provide ability of using really soft springs of low normal periods without high amplitudes of vertical body motion under heavy road impacts.

As far as spring rate (deflection rate) is concerned this was designed, for comparative purposes to be the same as that used in the standard independent suspension system of the car on which the installation was made.

Tests of the new suspension are said to have clearly demonstrated that on a car of this weight, at least (around 2800-3000 lb.), the use of leaf springs with progressive seats virtually eliminates completely the chance of bottoming. The usual rubber bumpers employed to guard against this condition could therefore be eliminated in the opinion of the committee.

A comparison of weights of component parts of the new suspension with the standard suspension is given by the committee as follows:

	Coil lb.	Leaf Springs lb.
Spring assembly ...	36	55
Wishbone assembly	39	0
Front cross-member	33	18
Spring clips	0	1
Shock absorbers ..	36	20
Total	144	94

This, in addition to the simplicity of construction, the committee points out, should result in a marked saving in manufacturing cost.

In tests made on the car it is said that under the most severe conditions variations in track width did not exceed ⅛ to ¼ in. of compression and ¼ to ½ in. on rebound, equivalent to camber variations of 1 to 1½ deg. Experiments on spring stresses under brake application indicate a maximum of 15 to 20 per cent of the maximum load stress and it is stated that these stresses plus king-pin torsional deflections with wheels locked, are surprisingly lower than those noted with conventional longitudinal types of spring suspensions.

The design from a cost standpoint has the further effect of reducing the total number of bearings in the suspension system, there being four per wheel as against six per wheel in the comparable coil spring suspension, and seven per wheel with longitudinal conventional spring suspension of the semi-elliptic types (shackle bearings, etc.).

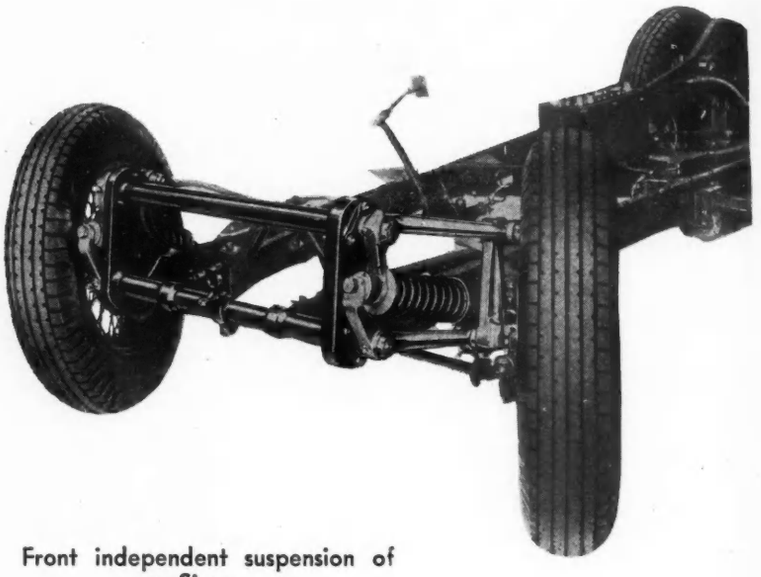
Of the total saving of 50 lb. in the table given above there is included a reduction of 15 lb. in unsprung weight, which should be of material benefit in improving riding qualities. In the original installation special steels were not used for the springs. There was no attempt made to lubricate the springs, although the provision of spring covers, etc., or some means of stabilizing frictional characteristics if desired or necessary should prove a simple matter.

Several car manufacturers are said to have offered their cooperation to the engineering committee of the Institute for continued experimentation in order to obtain data in connection with future production. The committee set up follows:

N. E. Hendrickson, chief engineer, Mather Spring Co., Chairman; Samuel P. Hess, chief engineer, Detroit Steel Products Co.; H. T. Dow, Spring Perch Co., Buffalo; E. H. Lindeman, Eaton Mfg. Co., Detroit; J. F. Bartuska, chief engineer, Maremont Mfg. Co., Chicago, and John H. Shoemaker, code commissioner. Karl Probst, chief engineer, Logan Gear Co., and E. L. Potter of the Dorel Corp., Detroit, consulting associates.

Floating Helical Springs Used in New Singer Front Suspension

by M. W. Bourdon
London Correspondent
Automotive Industries



Front independent suspension of new Singer car

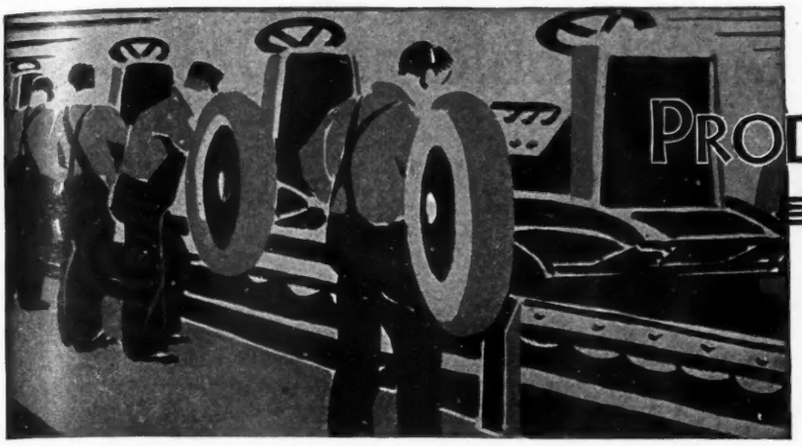
A NEW Singer 11 hp. is the first British car to have independent front springing other than by transverse laminated springs. The system used is known as that of Gordon-Armstrong and embodies helical springs. Upstanding brackets at the end of the frame sides are coupled by parallel cross tubes that form trunnion bearings for two bell-crank lever shafts, the main members of these levers constituting parallel links attached at their rear ends to the steering head, one to a point at the level of the wheel axis, and the other to the upper end of a lever integral with the steering head. The short ends of the bell-crank levers bear upon a coil spring, the upper one directly at the front and the lower one, through the agency of a central bolt, at the rear. The spring is thus supported entirely by the levers. Rubber buffers are provided, one inside the spring and the other between the two short cranks. Hydraulic shock absorbers attached to the frame sides are operated through links from the steering heads. To provide lubrication for the lever trunnion bearings, the cross tubes are sealed and filled with oil through a plug hole.

This system is claimed to overcome certain shortcomings of other designs. The wheel track is maintained, owing to the purely vertical motion of the wheels, and there is no inclination of the latter with spring deflection. The only effect of spring deflection is to slightly vary the wheelbase. Steering is orthodox, with transverse drag link.

The transmission system of this Singer differs from anything previously applied to a British car in that the "Fluidrive" or hydraulic transmitter is used in conjunction with a dual-plate clutch and an orthodox four-speed sliding gearset (with helical gears for second and third speeds) and a free-wheel clutch. All these are mounted as a unit with the engine. Power passes first from the crankshaft to the "fluid flywheel," then through the friction clutch, thence to the gearset and finally, as usual, through the free-wheel.

The provision of this hydraulic transmitter enables the engine to be idled with the car in gear and the clutch released, to be started from rest on top or any other gear without use of the clutch, to be stopped without touching the clutch pedal, and to prevent stalling of the engine on a gradient or elsewhere. It does not affect gear-shifting at all, either with or without the free-wheel operative, while a point of advantage is that it cancels out the vibration ordinarily felt, sometimes seriously, when a four-cylinder with a flexible mounting is asked to operate at very low speeds.

The Daimler Motor Co. of Coventry has just announced a new model with a 228 cu. in. eight-cylinder overhead valve engine. This is the only "straight eight" in production by a British manufacturer at present and the announcement is of importance also as marking the first breaking away of the Daimler company from the Knight sleeve-valve engine which it popularized and has used exclusively in its passenger cars since 1908.



PRODUCTION LINES

P & J

Among users of high-grade machine tools, the symbol P & J is always associated with Potter & Johnston. Our reason for bringing this up is that in a recent article the firm name of this well-known New England machine tool builder was incorrectly spelled due to a typographical error. We are quite certain that our readers knew that P & J stood for Potter & Johnston but we want to avoid any misunderstanding.

Eyes Right

Amazing how a good idea takes hold. One car maker recently sold the idea of a six-passenger automobile. Now nearly everybody has a six-passenger car, at least according to current S.E.P. advertising.

History Repeats

While collecting data for our Met Section paper on the new "camelback" truck jobs we found corroborative evidence that there's nothing new under the sun, even though this be a trite conclusion. In the first place practically all trucks built 'way back around 1910 had the cab over the engine. But the most interesting bit of information was a photo of a 1910 truck with a tiltable cab to permit engine accessibility. Moreover, the cab tilted to the front over the radiator so that this feature could be used regardless of the type of body mounting.

Smaller Size

A. W. Childs, chief of the automotive division, Dept. of Commerce, tells us that his department gets many inquiries for small high-speed diesels suitable for trucks under 3 ton capacity. Chief reason for demand is that many foreign countries have roads which can't permit larger equipment. Here is a good market for somebody.

Vapor Lock

Shades of vapor lock—it seems to have stalked many years ago—come back at the coming Annual meeting of the A.S.T.M. in June. Two outstanding speakers are on the program. G. G. Brown tackles "Motor Fuels and Vapor Lock," while T. A. Boyd of G.M.R. takes up "Motors and Fuel Vapor Pressure." These papers are intended to button up previous discussions of Comm. D-2.

Good Luck

Bob (REW) Harrison, new chief of the industrial machinery division, Dept. of Commerce, is a natural for the job. Well known among machine tool men and production executives for his accomplishments as chief engineer of Cincinnati Grinders, Bob also has been very active in the engineering societies. Makers and users of industrial machinery will find him an able and sympathetic ally.

Improved Alloys

Research project looking toward improving the quality of copper alloy castings is being sponsored by the Falcon Bronze Company. The project will be conducted at the Battelle Memorial Institute.

Redistributed

There is little doubt that heavy-duty truck design has swung to a redistribution of gross weight of the order of ⅓—⅔. This leads to many unique advantages as outlined in our recent S.A.E. paper. So far, White is the only manufacturer to carry the principle right down the line to their new 1½ to 2 ton models, where the change results in improved appearance and better tire loading. Will this idea take hold on other makes? Some fleet operators seem to be interested in the answer.

Art or Science

At a recent S.A.E. meeting a representative of a commercial welding shop intimated that maintenance welding is largely an empirical process dependent upon the skill of the individual. Does that statement completely define the present state of the art? It has seemed to us that welding had advanced far beyond this stage and that maintenance welding is well within the reach of a fair sized repair shop. What do you say?

Jacked Up

Some time ago we mentioned that built-in jacking systems have been adopted on a number of European cars. Our British correspondent reports after a special study that one popular English system is used as standard equipment on one or more models of the following makes: Rolls Royce, Armstrong Siddeley, Triumph, Standard, Humber, British Salmson, Alvis, A. C. Truly a most interesting development and one well worth watching on this side of the pond.

Takes It

Several times recently a collision between a steam train and something on the track has resulted in serious injury to the train. But precedent means nothing to the Budd-built Burlington Zephyr. According to a newspaper report, the stainless steel train while on its maiden trip hit a stalled truck at 40. It cut the truck in twain with only superficial scars to show for the encounter. Moreover the passengers knew nothing of the accident save for the effect of the sudden application of brakes.

Good Data

Republic has just completed a good-looking bulletin on Enduro 18-8. To readers of this column its appeal is the authoritative data on physical properties, corrosion, and machinability. Ask us for Bulletin 125.—J. G.

MANUFACTURING MANAGEMENT METALLURGY

Cost Recovery Problems Delay Approval of APEM Supplements

by Athel F. Denham
Detroit Editor, Automotive Industries

ALTHOUGH three product group supplements have tentatively passed the NRA and some fourteen others have been filed, not a single APEM supplementary code to date has been finally okayed and signed.* Public hearing dates on further supplements have been set and cancelled soon thereafter. What has happened?

Neither the NRA nor the APEM have issued official statements, but *Automotive Industries* has good reason to believe that dissension within the NRA as to the interpretation of provisions against "selling below cost" are at the heart of the matter.

The NACC code does not contain such a provision but the APEM code does. The APEM master code, however, leaves it to the supplementary product group codes to say how cost shall be determined in each of the many subsidiary industrial groups covered by the master code.

The reason therefore is perfectly obvious. In the first place the code embraces both original equipment, accessory and replacement parts producers. In many cases, in addition, parts and equipment manufacturers produce material for both markets.

It might be said that a piston is a piston, a wheel is a wheel and a leaf spring a leaf spring whether sold for original equipment or replacement, and that the methods of arriving at the lowest permissible cost should be identical, no matter to whom they are sold. This, however, does not hold true for one obvious reason primarily.

In the sale of most parts for original equipment engineering design ingenuity represents a major factor in sales efforts. Vehicle manufacturers balance engineering advantages against cost. The cheapest usable product is frequently not the most desirable. A higher priced product for the same basic purpose may have sufficient additional engineering features to make its adoption profitable, particularly if those features can be made useful in the merchandising of the completed vehicle.

There are of course exceptions. Many relatively standardized parts including even such important items as leaf springs, perhaps, are bought on blue-print quotations, the vehicle manufacturer issuing the design blueprints for bids by competitive companies. After that the only qualifications necessary are that the materials and workmanship of the bidder must be acceptable to the vehicle producer, and that his price must be "right." For a group such as this, determination of a representative *minimum* price for all producers has considerable backing as the most equitable solution.

In the main, however, original equipment parts do not fall strictly in this classification, and it therefore appears undesirable to set standard minimum prices for the majority of original equipment parts.

Here the most satisfactory answer may be a provision that each manufacturer shall not sell at a price below his own cost, individual manufacturers therefore setting the minimum. However, it would appear necessary that some provision should be permitted enabling a producer with a higher cost of production to cut his price to meet that of a competitive bidder, PROVIDING that the competitor is not selling below his own cost.

A standardized form of cost accounting would have to be developed, of course, for each particular product group of manufacturers, fitting their specific problems,—so that an equitable means of cost appraisal would be available. It is understood, that both this and the above provision for meeting competitive costs are included in some of the APEM product group codes for original equipment manufacturers.

In the replacement field, however, the picture is somewhat different. Here the majority of independent parts producers in various fields base their engineering design largely on the specific factory equipment. Sales are dependent at present primarily on the following factors:

1. Distribution effectiveness
2. Price
3. Merchandising and promotion
4. Quality

It is doubtful that basically any change in methods of pricing that might arise under the code would affect items one and three. Distribution effectiveness would still remain the major key to sales. However distribution effectiveness to a large extent depends on the three other factors, and in recent years the major one has been that of price—resulting in cut-throat competition, particularly on the question of trade discounts. In addition, quality also has been sacrificed in some cases in the battle for business.

Car manufacturers and responsible replacement parts producers alike could hardly consider such a situation with favor. Lowering of quality to cut costs cannot be considered beneficial to the consumer who finds his "bargain" pretty expensive in the long run.

In cases of this kind, for such groups of manufacturers, the setting up of a standard minimum price on specific types and sizes of replacement parts perhaps is the most equitable solution. Such a minimum price might be based on analysis by various producers in that group of manufacturing cost of the actual part used as original equipment, and manufactured to the same accuracy of workmanship and with the same quality of materials.

Then if a producer of replacement parts wishes to take chances on lowered quality, he cannot derive therefrom the benefit of a lower permissible price. Such increases as he may obtain in the way of profit would in the long run be offset by loss of confidence in his product.

Another important point in this respect arises from competition between car and independent parts manufacturers in the replacement field. Car manufacturers on the whole are willing to "play ball" with parts producers in keeping cut-throat price competition out of the after-

Automotive Industries' report last week that the leaf spring supplement had been approved was based on an NRA release. We are now informed that NRA subsequently withdrew its approval.

market picture. The car producer, however, is in a position where any cut-throat competition initiated by independents can be more than met with sharp price reductions by selling parts below cost. In such a case the only alternative left to the parts people would be to reduce quality in order to reduce costs—or go out of business. Establishment of a "representative cost" on products falling in such groups would offer an excellent safeguard in this direction.

It might be possible, of course, and it is understood that this has been suggested, to incorporate in product group supplements "quality specifications" instead of representative prices. For some types of products this might be feasible, but for the majority the technical, commercial and policing difficulties involved would be so great as to prevent any possibility of success.

Of course, there would be nothing to prevent a manufacturer from selling his products at a higher price and, if he can justify such a price by variations in design and the use of even higher quality material, he would be even better off than now when he is faced with the possibility of both price and quality cutting.

Even in the replacement or so-called "after market" field there are specific product groups for which it would be impossible to set representative minimum prices for the entire group. This applies for instance to producers of such accessories as shock absorbers, carburetors, etc., in which the design of the "replacement unit" does not necessarily follow or need not necessarily be based on factory equipment.

As a matter of fact, it would seem almost impossible to set representative minimum prices for groups of manufacturers producing parts or equipment of individualized proprietary design.

The third classification of automotive parts and equipment manufacturers is that large group selling to both the original equipment and replacement markets. Here it might easily be necessary to have manufacturers in certain groups subject to two codes or two methods of pricing. Crankshaft bearing manufacturers might be a case in point. There are proprietary designs and methods of manufacture of such bearings and these perform an important function in the merchandising of such parts for original equipment. Once the proper type of bearing has been selected, however, the reproduction of that bearing, while perhaps involving the question of patents, is the major problem confronting replacement parts producers.

If a bearing producer can sell an engineering department on the adequacy of a low cost bearing, he should not be limited as to minimum price by the setting of a representative group price. When he and his competitors go out to the replacement field with bearings for that particular engine, however, there is some protection needed against further quality reduction on a price competition basis. Here, it is felt in some quarters, a definite minimum price for the entire group should be in order, based on the representative cost of reproduction of the standard equipment bearing by the entire group.

Automotive Oddities—By Pete Keenan

JUNE BREWESTER HAS THE ONLY REAL INTERNATIONAL CAR. IT IS MADE UP OF PARTS FROM ALL OVER THE WORLD.
Name of an Automobile Worker:
Eugene Gasselin. Detroit. Mich.
THE AUTOMOBILE DOLLAR. GENERAL SI-KENG SHOCKED CHINA BY ISSUING THIS COIN— NATIVE SUPERSTITION HAD IT THAT FOR HIS VANITY— A CAR WOULD BRING HIM VIOLENT DEATH— AND IT DID.
PROFESSOR T. EDWARD MOODIE OF GEORGIA TECH BUILT THIS "ROAD-PLANE" IT IS CONTROLLED BY RUDDERS.

Automotive Industry Broadens Uses of MACHINEABLE

THAT machineable stainless steels are finding an ever-increasing sphere of usefulness in the automotive industry is evident in even a casual study of current applications. Perhaps an outstanding example is that of the Outboard Motors Corp., well-known manufacturers of outboard motors for general purpose and racing craft, whose 1934 outboards feature a great percentage of stainless steel in the form of strip and a machineable grade.

If we examine the situation in the automotive field we find that the machineable grades are now being consumed in large volume chiefly in the production of fastenings such as studs, screws, nuts, etc., also in the manufacture of pump shafts.

Out of the gamut of stainless steels on the market today with their varying specifications designed to meet varying degrees of resistance to corrosion, high temperature effects, etc., certain modifications have been made by a number of steel companies to produce machineable grades meeting a normal range of requirements. From such work have developed two general types of machineable stainless steels, one a form of chromium iron susceptible of hardening through heat treatment; the other, an 18-8 rustless iron of the austenitic type.

In general free-machining is induced in either the straight chromium irons or the 18-8 austenitic steels by the use of either sulphur or selenium. Sulphur is almost universally used for the straight chromium irons while sulphur and selenium are equally popular for modifying the austenitic steels.

There are some exceptions: For example, Bethalon A is produced with an addition of molybdenite (MoS_2) while Bethalon B (18-8) contains the same ingredient instead of selenium. Carpenter Stainless No. 5 originally contained zirconium sulphide but the regular grade features an addition of 0.30 per cent sulphur.

The 18-8 grade, as is well known, is an austenitic material which is not susceptible of hardening through heat treatment, although it is surface-hardened by cold working. Under most conditions the austenitic grade is non-magnetic and, consequently, can be of great value in aircraft and marine applications for the fabrication of parts around the compass, also for the gear mechanism of rudder controls where they are adjacent to the compass.

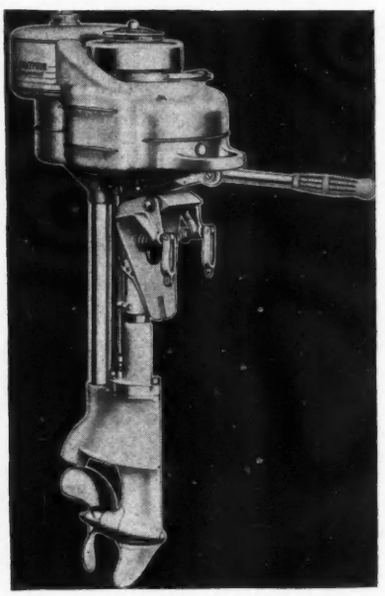


Fig. 1 — Lightfour, 1934 product of Outboard Motors Corp., features a large percentage of stainless steel strip and machineable grades in its construction

While, obviously, it is difficult to get a complete list of applications in the automotive industry, we have succeeded in compiling a partial list which may suggest many other uses. Fig. 2 is a panel representing some of the component parts of the outboard motors and in this group the long shafts and several of the smaller parts are made of Carpenter No. 5, which is a free-machining low carbon chromium iron. Table 1 gives a condensed list of these parts.

Table 2 gives a partial list of current applications in the automotive field. There are undoubtedly many other specific examples but it is hoped that this list may serve to suggest other uses. For example, it has been suggested that nuts, cap screws, hardware screws, and studs used as exhaust manifold fastenings might well be made of a suitable machineable stainless steel since the normal resistance to corrosion and temperature effects of such materials should make these connections much easier to service. Among other applications which might be investigated are the use of a machineable stainless steel grade for the spark plug body, brake connections and water pump shafts.

Coming to a detailed discussion of free-cutting stainless steels, Table 4 gives a partial list of proprietary grades now on the market.

The typical range of properties of the free-cutting stainless steels which may be described as low carbon chromium irons, are as follows:

Chemical Analysis

Carbon	max. .12
Manganese	max. .50
Phosphorus	.03
Sulphur	.15-.40
Silicon	.50
Chromium	12.50-15.00

Average Physical Properties (Annealed)

Yield point	46,000 lb. per sq. in.
Ultimate strength	75,000 lb. per sq. in.
Elongation in 2 in.	27½%
Per Cent Red. Area	60.
Brinell	150

By Joseph Geschelin
Engineering Editor
Automotive Industries

STAINLESS STEELS

Carpenter stainless steel No. 5, which comes in this classification, has a typical analysis: Carbon, 0.10; manganese, 0.45; chromium, 14.00; sulphur, 0.20; silicon, 0.30. Yield point and tensile strength of Carpenter No. 5 run somewhat higher than the average physical properties and, when hardened and oil quenched, are practically double the values given above.

Bethalon A, which is also of the same general type, has the following type analysis: Carbon, 0.11; manganese, 0.30; chromium, 13.00; molybdenite (MoS_2), 0.50.

The average properties and type analysis of the machineable grade of the 18-8 rustless iron, are as follows:

Chemical Analysis

Carbon	.08-.20
Manganese	.75-1.25
Silicon	max. .75
Chromium	16.50-20.00
Nickel	7.00-10.50
Selenium	.15-.30

Average Physical Properties

Annealed and Centerless Ground

Yield point	52,400 lb. per sq. in.
Tensile strength	98,400 lb. per sq. in.
Reduction of area	59%
Elongation in 2 in.	50%
Brinell	179

As an example of the variation from the typical analysis, note that Carpenter stainless steel No. 8 has the following type analysis: Carbon, 0.10; manganese, 1.00; chromium, 18.00; nickel, 9.00; selenium, 0.25. Its physical properties also differ somewhat from the average figures given above. In a similar fashion we find some variation in the type analysis of Bethalon B, which runs as follows: Carbon, 0.13; manganese, 0.30; nickel, 8.00; chromium, 18.00; molybdenite (MoS_2), 0.50.

It seems obvious from the foregoing that while the machineable grades may be grouped in a general way for the purpose of discussion, there are essential differences be-

Table 1 Outboard Motor Parts (Outboard Motors Corp.)

Propeller Shaft	Drive Shaft Coupling
Grease Plug	Stern Bracket Clamp Screw
Gear Housing Flange Stud Nut	Gear Housing Studs
Muffler Water Connecting Screw	Carburetor Fuel Adjustment Needle
Gear Housing Cap Screws	Carburetor Air Valve Trunnion
Gear Housing Flange Studs	Muffler Screw Stud
Pivot Bearing Bushing	

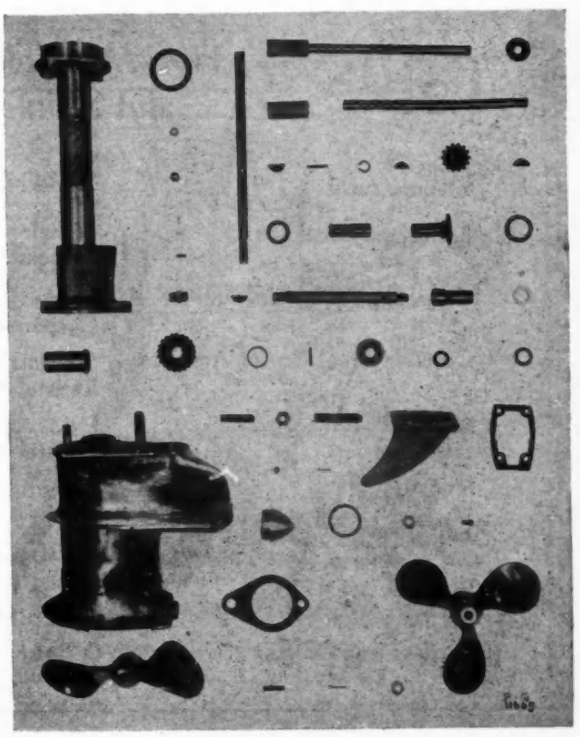


Fig. 2—Some of the parts that go into the 1934 Outboards. The large shafts and other small parts are produced of stainless steel

tween the various proprietary grades. And, as usual, these differences, small as they might be in some cases, may form the basis upon which selection will be made in any given case.

In general, the free-cutting chromium irons as discussed in this article will successfully resist practically all of the commonly encountered corrosive agents, including salt water and salt air, steam, nitric acid solution, hot and cold oil, gasoline, alcohol, benzol, nitric acid, lime, etc. They do not resist hydrochloric, sulphuric or hydrofluoric acids.

On the average, the materials on the market will remain practically scale free up to a temperature of 1100-1200 deg. F., and for certain purposes can be used up to about 1500 deg. F. To develop machining properties the material is annealed by heating between 1300-1400 deg. F., soaked for about an hour or a sufficient length of time to insure thorough penetration and cooled in still air. Brinell hardness number in the annealed state runs from 187 to 229.

The specifications for heat treatment are comparatively simple and vary to some extent with the character of the proprietary grade. Materials of this classification can be readily machined, ground, polished and bored. It is claimed that the machineable grades of chromium irons now on the market can be turned, drilled, bored or threaded as easily as ordinary screw stock using the same speed, feed, depth of cut, and tooling.

The machineable grades of proprietary 18-8 rustless steels are resistant to a great number of organic and inorganic acids and salts except hydrochloric and hydrofluoric acids, bromine, iodine and aqueous solutions of a few compounds of the halogen acids. In general these materials will resist scaling up to temperatures around 1800 deg. F.

The free-cutting 18-8 grades are not quite as machineable as those of the chromium irons and must be handled at somewhat lower speed and feeds. For example, Carpenter No. 8 is said to be readily handled on automatic screw machines at 60 to 70 per cent of the speed of ordinary screw stock. For Bethalon B a speed of 80 to 90 ft. per minute is recommended.

Recent tests made by Republic Steel Corp. on a 7/8 Gridley automatic indicate the possibility of machining at a surface speed of 125 ft. per minute providing the width of form does not exceed ½ in. and the drill depth does not exceed 1 in. On turning and cutoff operations they feel that this speed can very likely be exceeded.

Free-machining grades also are said to be greatly superior to the regular grades for grinding and polishing and consequently are preferred wherever these operations are required. Another point of superiority of the free-machining grades is the matter of freedom from galling, scratching, and seizing. The non-galling characteristics make the free-machining grades particularly valuable for water pump shafts, and pins or bushings which must operate freely.

Needless to say the successful development of the metal cutting properties of these materials de-

Table 2 Automotive Applications Free-Machining Rustless and Stainless Steels

Capped Bolts for Bumpers	Carburetor Parts
Pump Shafts	Water Pump Shafts
Bolts, Nuts, Castellated Nuts	Shaft and Bushing for Exhaust Manifold and Water Heat Control
Upholstery Tacks	
Lock Washers	
Carburetor Parts, such as Bolts, Nuts and Dampers	No-draft Window Regulator Parts
	Exhaust Manifold Studs and Nuts
Exhaust Valves	Exhaust Damper Bushings
Carburetor Needles	Water Pump Packing Nuts

Gear Mechanism of Rudder Control System (Marine)

Table 3 Free-Machining Rustless and Stainless Steels

Manufacturer	Trade Name
Bethlehem Steel Co.	Bethalon A Bethalon B (18-8)
Carpenter Steel Co.	Carpenter No. 5 Carpenter No. 8
Crucible Steel Co. of America	Stainless Steel No. 2s Rezistal KA-2 FM
Halcomb Steel Co.	FM2 Rezistal KA-2 FM
Industrial Steels	Industrial No. 512
Latrobe Electric Steel Co.	Stainless Iron LS Stainless Iron LMS
Republic Steel Corp.	Enduro (18-8) Enduro FC
Rustless Iron Corp.	Defirust

pends upon the selection of a correct cutting fluid. We gather that most of the work has been done with some suitable type of highly sulphurized mineral oil or a mixture of mineral oil and a sulphurized base. However, the selection of the cutting fluid must depend on a great many variables, not the least of which is the precise nature of the cutting operation.

We may well conclude with the thought that progressive engineers and production men must consider seriously the possible utilization of machineable stainless steels in their product. They offer a remarkable opportunity of improving fastenings of all kinds, particularly in exposed places and at points where frequent servicing is required. And, of course, these materials already have demonstrated their value in the manufacture of pump shafts and parts exposed to salt water and other liquids.

First Diesel-Electric Railcar Covered 647,700 Miles

What is said to have been the first railcar with Diesel-electric drive ever built was turned out by the Diesel-Elektriska Wagn Aktiebolaget in Vasteras, Sweden, in 1913. The car was in service until recently and may be runing still. To the end of September, 1931, it had covered 647,-700 miles, or approximately 100 miles per day for 18 years.

Bigger Cars for Less Money

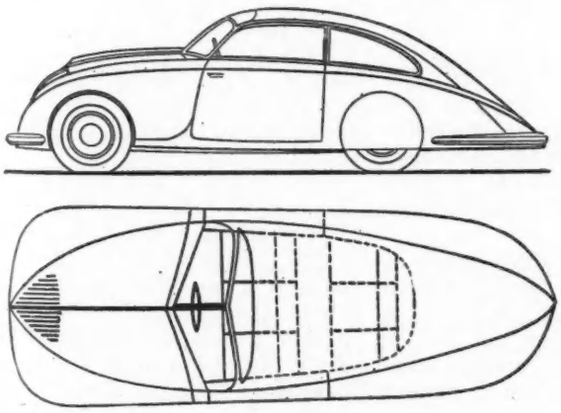
(*Continued from page 613*)

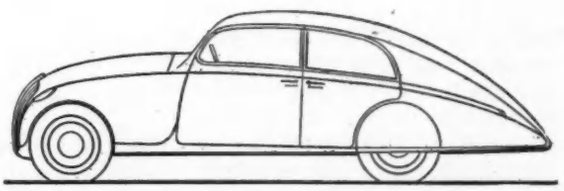
and in motor-car engineering generally, should make it possible to produce a 2,000-lb. car far more serviceable than cars of similar weight of a decade ago.

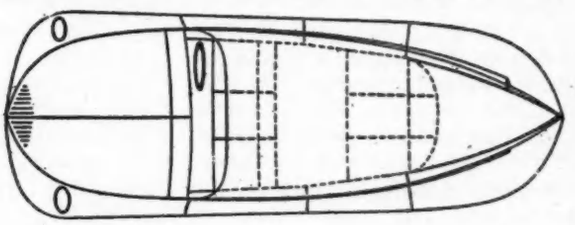
The one thing that tends to deter manufacturers from venturing into the field of smaller cars is the apparently trifling character of the savings on manufacturing costs that can be effected by size reductions. It must be remembered, however, that in addition to the saving on manufacturing cost there is the saving on operating cost. Both fuel and tires have been at record low prices during the recent past and have begun to advance, and there is every prospect that operating economy will have more influence with purchasers in the future than it has had before.

There is perhaps little likelihood that one of the present quantity-production models will be trimmed down in size. Reducing the size of the package is never a very effective sales stimulant. What is more likely to happen is that the manufacturer of one or the other of these cars will come out with an additional, smaller, lower-priced model which, if it meets with a sufficient demand, can later on be made the only production model or at least the leader of the line. In fact, one of these manufacturers is said to have a smaller model fully developed now and to be waiting for the time when market conditions will justify launching it.

Streamlining à la Italienne

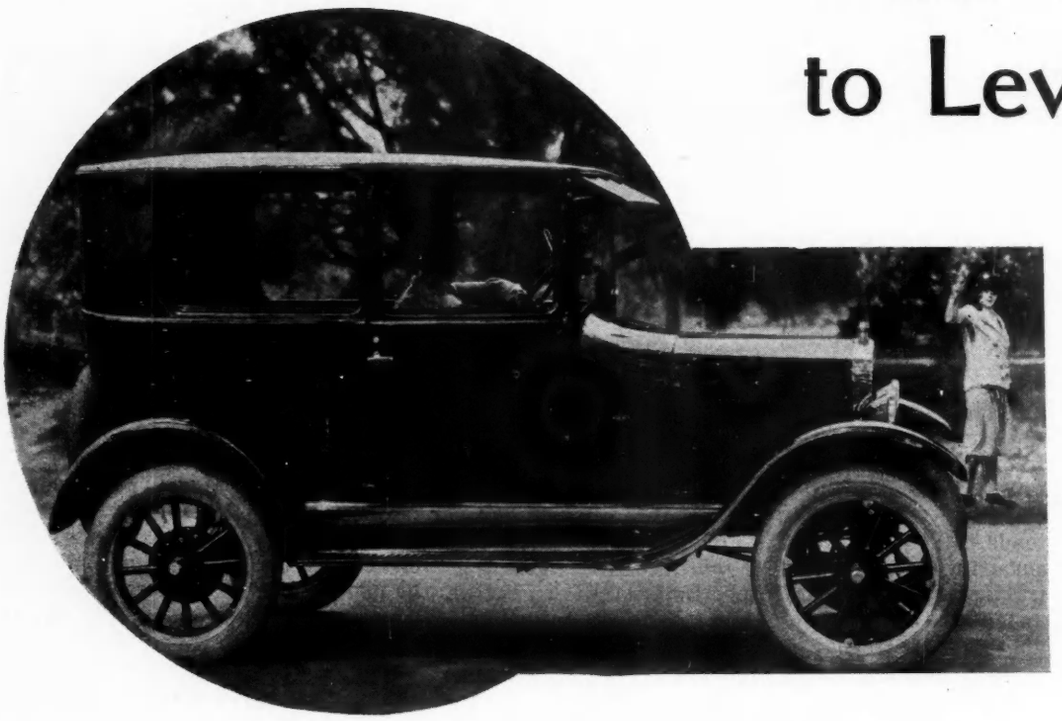






Herewith are shown two designs of streamline cars from an Italian source. The front-end design evidently was inspired by the Chrysler and DeSoto. The streamlining appears to be exceptionally good, but the rear seat seems to be directly over the rear axle and there is a long tail behind the rear axle, which features are not so good—from the riding and maneuvering standpoints respectively.

Miss Perkins to Level Out



"I am old-fashioned enough still to admire the old Model T Ford," says Labor Secretary Perkins. The automotive industry admires it too for the great car it was. But neither automotive production nor employment would be providing the stimulus to recovery that they are, if the industry were trying to sell it and cars of similar vintage in the 1934 market

THE naive ideas Labor Secretary Perkins expressed last week on how the industry might iron out the fluctuations in its output, has served again to focus attention on this important social and economic problem.

Miss Perkins' cure for the ups and downs of automobile production is simple—standardization. "Putting style into the automobile is one of the most absurd things the industry ever did," she said. "This industry has accepted standardization for one year periods, but must extend its practices to include standardization over a period of years. . . . I am old-fashioned enough still to admire the old Model T Ford."

Apparently the industry has been on the wrong track. It has been laboring under the delusion that changing its models annually served to increase both sales and employment. Instead Miss Perkins tells it that its efforts to get the public to buy more cars have resulted only in accentuating fluctuations in production and employment.

Miss Perkins' ideas on regularizing the automotive industry appear to have been gained largely from contemplation of the industry's jagged production and employment curves, and the unquestioned hardship these irregularities work on the industry's employees. The industry is fully conscious of these peaks and valleys but there are other elements in the problem which either Miss Perkins does not know or chooses to disregard—unless she also expects that economic planning can be used to provide standardized customers to buy the standardized cars.

The curious thing about much of the criticism of the fluctuations in automotive production, is that it seems to overlook that the dollars and cents cost of such irregularities for years has maintained strong pressure on management toward more uniform output. Certainly production men would like nothing better than to produce a standard unit over a period of years. But besides designing and building cars, the industry has one other problem that is usually considered of some importance and that is selling them.

Since this problem must be solved before there can be either production or employment, it is natural that it should be regarded as a controlling factor. The industry believes that the best solution is provided by yearly model changes. Its experience indicates that with a new model every year, it sells more cars and hence gives more total employment. If it abandoned this policy in favor of the production of a standardized car over a period of years, it might provide more regular employment although normal seasonal factors would still be present. But unless there are a lot more people like Miss Perkins who think the Model T still is a satisfactory car than is generally believed, total man-hours of work in the automotive industry would take a nose-dive. Perhaps less work pro-

Would Bar Yearly Models Automotive Ups and Downs

Labor Secretary charges style in motor cars is absurd and urges continued production of standardized designs over a period of years

by Don Blanchard
Editor, Automotive Industries

vided more regularly is better than more work less regularly, but the industry doesn't think so and it is doubtful that labor does either.

If stabilization were within the reach of capital, labor or the government, it would have been attained long ago, for the first two at least would benefit immensely by it. But none of them is in a position to control the situation. The public has the whip-hand. It dictates when and what it will buy, and business men know from hard experience that they have no choice but to conform.

Incidentally there was no complaint from Washington during the early months of the year when the industry was expanding employment by leaps and bounds. There was no suggestion at that time that the industry should throttle output so that employment would be spread over more months. Then Washington was only too glad to point to the industry's records and to use its payrolls to swell reports of reemployment. Now that the industry is passing its seasonal peak with consequent reductions in employment, criticism starts. Perhaps it is because it is easier to plan the past than the future.

The industry does not deny that the fluctuations in its production are open to criticism. It has first-hand knowledge of its effects not only on its workers, but also on its operating statements. But it believes with the President that criticism should be constructive—not merely off-hand opinions based on only one of the elements in the situation.

It will be recalled that the Automobile Code required the N.A.C.C. to make a report on stabilization by the first of last December. This report was made but its details have not been revealed. One plan that has received some consideration, however, is for all makers to bring out their new models at about the same time in the fall. Production statistics are said to show that announcements at that time result in smaller seasonal fluctuations than do January show introductions.

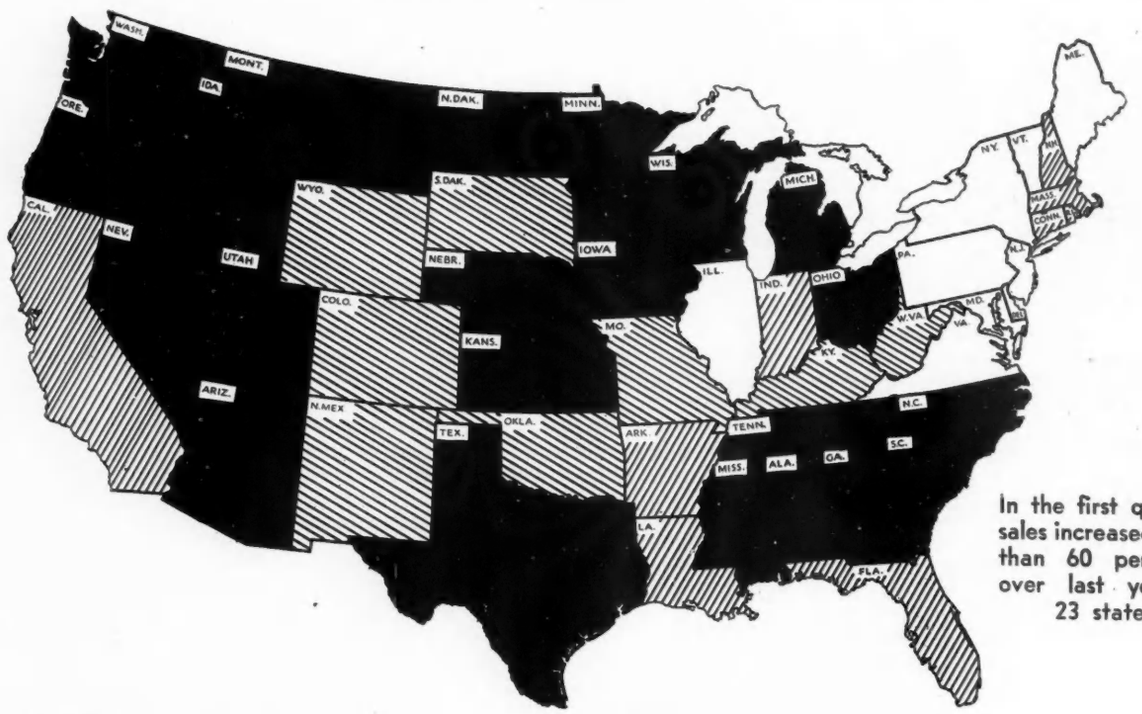
However, surveys of manufacturer opinion at the New York Show indicated that there was far from unanimous support for this proposal. In fact many manufacturers felt that it would make conditions worse rather than better, particularly in the tool and die end of the business. There is also some talk of spreading announcements over the year according to some schedule agreed upon by the manufacturers, but the difficulties of this scheme are more or less obvious. Quite a few feel that the best plan is to let each maker bring out his new models when he sees fit on the ground that this would tend to spread model changes more uniformly over the year and thus help to regularize employment for the industry as a whole. Of course, this departure from the present plan of introducing new models in November and December would tend to disrupt merchandising as some maker would be cleaning up just about all the time. It was to concentrate clean-ups in one period that was the original reason for seeking uniform new model announcements.

Thornton Tandem Units Redesigned

A number of design changes have been made in the Thornton Tandem six-wheel units since their announcement in these columns some time ago. An important change is that the transfer case is now split horizontally, for ease in assembling and servicing. The top half of the case can be removed for inspection of the entire mechanism.

Several lubrication improvements have been worked out. Troughs over the larger ball bearings ensure a steady oil supply. The intermediate shaft is now locked in the case, and the gear cluster on it is given a certain axial freedom to permit of a self-centering action of the gears.

The trunnion shaft has been lowered, providing for a decrease in the height of the center of gravity and a more direct line of drive



In the first quarter, sales increased more than 60 per cent over last year in 23 states.

0 to 20% Ahead of 1933

20 to 40% Ahead of 1933

40 to 60% Ahead of 1933

Over 60% Ahead of 1933

U. S. New Car Registrations and Estimated Dollar Volume by Retail Price Classes

March 1934 and 1933 Compared

	UNITS					ESTIMATED DOLLAR VOLUME				
			Per Cent of Total		Per Cent			Per Cent of Total		Per Cent
	1934	1933	1934	1933	Change	1934	1933	1934	1933	Change
Chevrolet, Ford and Plymouth	127,914	52,343	73.8	66.6	+144.0	$79,300,000	$29,300,000	65.7	54.2	+171.0
Others under $750	16,722	13,005	9.6	16.5	+ 28.7	11,900,000	8,500,000	9.9	15.7	+ 40.0
$751-$1,000	20,892	7,176	12.1	9.1	+191.0	17,300,000	6,300,000	14.3	11.7	+175.0
$1,001-$1,500	5,612	3,669	3.2	4.7	+ 53.0	6,800,000	4,300,000	5.6	7.9	+ 58.0
$1,501-$2,000	815	1,194	0.5	1.5	— 31.8	1,400,000	2,100,000	1.2	3.9	— 33.3
$2,001-$3,000	989	925	0.6	1.2	+ 7.0	2,700,000	2,300,000	2.2	4.2	+ 17.3
$3,001 and over	320	327	0.2	0.4	— 2.2	1,300,000	1,300,000	1.1	2.4	none
Total	173,264	78,639	100.0	100.0	+120.0	$120,700,000	$54,100,000	100.0	100.0	+123.0
Miscellaneous	23	102								
Total	173,287	78,741								

U. S. New Car Registrations and Estimated Dollar Volume by Retail Price Classes

Three Months 1934 and 1933 Compared

	UNITS					ESTIMATED DOLLAR VOLUME				
			Per Cent of Total		Per Cent			Per Cent of Total		Per Cent
	1934	1933	1934	1933	Change	1934	1933	1934	1933	Change
Chevrolet, Ford and Plymouth	240,989	151,719	73.2	66.5	+59.0	$146,800,000	$85,500,000	64.0	54.1	+71.6
Others under $750	31,614	37,042	9.6	16.3	—14.6	22,300,000	24,100,000	9.7	15.2	— 7.5
$751-$1,000	38,966	19,497	11.8	8.6	+99.5	32,100,000	17,000,000	14.0	10.7	+88.9
$1,001-$1,500	12,429	11,560	3.8	5.1	+ 7.2	14,900,000	13,600,000	6.5	8.6	+ 9.5
$1,501-$2,000	2,357	4,014	0.7	1.8	—41.5	4,100,000	7,000,000	1.8	4.4	—41.4
$2,001-$3,000	2,198	2,761	0.7	1.2	—20.5	6,000,000	6,900,000	2.6	4.4	—13.0
$3,001 and over	770	1,035	0.2	0.5	—25.6	3,100,000	4,100,000	1.4	2.6	—24.5
Total	329,323	227,628	100.0	100.0	+44.9	$229,300,000	$158,200,000	100.0	100.0	+44.9
Miscellaneous	93	398								
Total	329,416	228,026								

NEW DEVELOPMENTS
Automotive Parts, Accessories and Production Tools

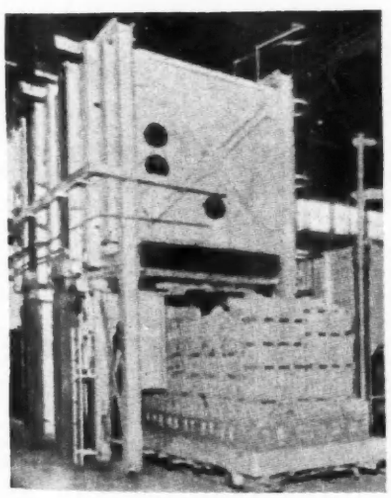
Short Cycle Malleablizing Furnace

A short cycle malleablizing furnace which reduces the total time for heat treatment from the conventional six, eight or ten day period, to 72 hours or less, is announced by the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa. Elimination of decarburized surfaces, hard skin or hard spots on the surface, picture frame structures, burned or scaled castings, is done by malleablizing based on the chemical analysis of the cast iron in an electrically heated furnace having automatically controlled atmosphere.

The heating up of the charge is done at night, during off-peak load, with only radiation losses supplied during the day: Furnaces range from ½ to 25 tons, with maximum night time electrical loads of 40 to 600 Kw., and corresponding electrical capacities of 13 Kw. to 75 Kw. during the daytime.

Since a definite time-temperature cycle is laid out, depending on the chemical analysis of the iron, every casting must be of the highest quality as to tensile strength, elongation, and machinability, for the particular analysis. Any up-to-date plant having average melting supervision and analysis control may employ successfully this 72 hours annealing cycle. Twenty-six hour cycles have been obtained by companies having these furnaces in operation on castings ½ in. thick and where the analysis is carefully controlled.

Packing materials and heavy cast iron pots are not required. Some castings may have to be annealed in boxes, but without the use of packing material. These include castings that will not withstand much weight without danger of warpage, or small castings that cannot be stacked up on the car in sufficient quantity to produce a full charge. Boxes made of ½ in. sheet steel have been in commercial use for 240 heats without signs of scaling.



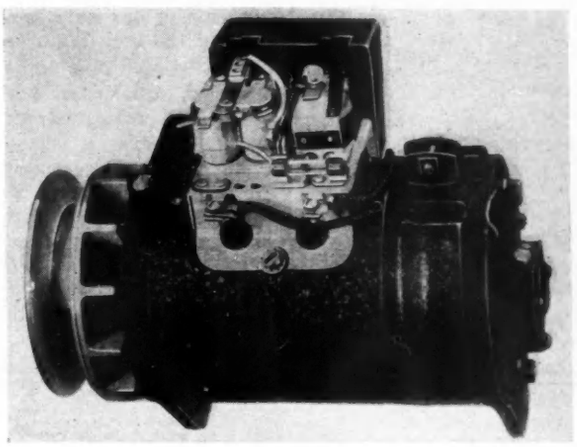
Delco-Remy "Aero Volt" Generator

A new type of high-capacity automobile generator has been developed by the Delco-Remy Corporation, Anderson, Ind., to meet the increased electrical load imposed by unusual operating conditions and such car accessories as radios, fan-driven heaters, cigar lighters and road lights. It is known as the Delco-Remy "Aero Volt" generator, model 935-L.

When the generator is hot, the output exceeds 16 amps. at road speeds between 20 and 50 m.p.h. Even at a 75 m.p.h. the output remains above 12 amps. To obtain this high capacity without overheating, the generator is equipped with ventilating louvres and a suction fan built integral with the belt pulley.

The generator, battery, lights and other electrical units are protected against damage from high voltage by an automatic voltage regulator. A safety fuse provides still further protection.

The "Aero Volt" generator is finished in crystal enamel and the balanced vacuum fan pulley is cadmium plated.



Tempering Furnace for Small Articles

A Homo Tempering Furnace specialized for heavy, dense loads of small articles has been introduced by the Leeds & Northrup Company, Philadelphia, Pa. With this furnace, it is possible to dump a large load of dense work . . . small bolts, rivets or other small parts . . . into the work basket, without distributing them on trays, and yet secure straight-line uniformity.

Actual temperature-exploration charts have been made from practical heats carried out under actual production conditions. For one of these tests, eight thermocouples . . . pre-checked for uniformity . . . were distributed at various points throughout a load of 800 lb. of ¼ in. by ¾ in. rivets, poured into a 25 in. by 19 in. work basket. Production of rivets was 960 lb. per hour to uniformity; on 3 in. by ⅜ in. bolts, 1100 lb. per hour to uniformity.

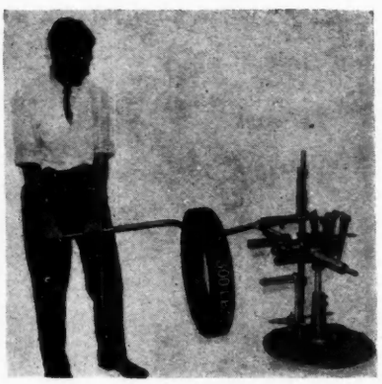
A newly designed fan is used in this specialized furnace. Each part is said to be heated alike . . . parts at the bottom are heated to the same temperature at the same rate as parts at the middle, top and sides. Other characteristics of Homo Furnaces are retained.

NEW DEVELOPMENTS

Automotive Parts, Accessories and Production Tools

Littell Automatic Centering Reel

F. J. Littell Machine Co., Chicago, Ill., has brought out a new reel for holding coils of steel strips for punch press operations.



The No. 3 Littell Automatic Centering Reel, 300 lb. capacity, as well as the No. 5 Automatic Centering Reel, 500 lb. capacity, have the unusual feature of all the arms being equally spaced from the center of the reel. Thus when a coil of a larger diameter is to be placed on the reel the arms can be run out on a larger radius by turning the reel like a capstan.

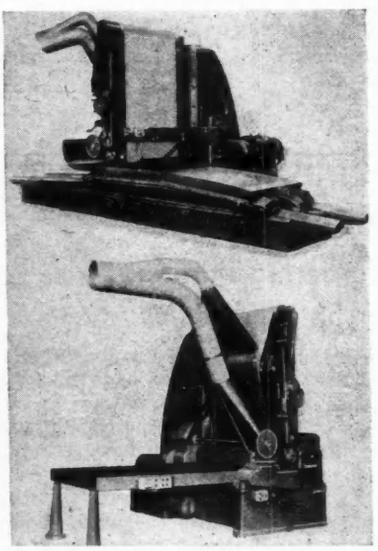
This means that the coil is always balanced, which is of great importance since most reels are used with automatic feeds.

An additional feature of these reels for coils weighing up to 400 lb. is the quick loading lever which makes it an easy loading job for one man. A lock is provided for locking the reel spider from rotation during the operation.

Abrasive-Belt Sheet Grinder

Mattison Machine Works, Rockford, Ill., has developed a machine for grinding alloy, carbon and other forms of sheets. Factory-coated abrasive belts are used instead of abrasives in the form of set-up rolls and belts. The grinders are built with the necessary weight to insure rigidity and freedom from chatter and vibration, and with the necessary accuracy and precision in construction, to take full advantage of these improved abrasives.

Two models are illustrated. The roll-feed model is designed for superficial and rough grinding where one pass under the abrasive is sufficient. This model also lends itself to tandem operation whereby a number of units may be set in line, with the stock passing from one to the next progressively. The model with reciprocating table is designed for the finer finishing operations where more than one pass is required. Thin sheets resting on the curved surface of the table are flexed so that buckles are evened out and a flat cross section is always presented to the grinding belt. Since the sheet is flexed in the direction opposite to the curve of the grinding roll, penetration of the abrasive grain into the surface of the metal is improved, and better cutting action is said to result. Due to the short contact at the cutting point, the cut of each grain is shortened, thus breaking up the cuts and preventing long scratches in the work.



The main arm carrying the abrasive grinding belt, driving and idler rolls, is vertically adjustable as a unit on the heavy column for different thicknesses of material and for setting to the cut. Belts are quickly changed, as it is only necessary to lower the top tensioning idler, remove the belt and slip on another and run up the tension roll. The outer side is open so that no bearings or any other parts have to be removed in this operation.

Standard sizes of these machines carry belts up to 50 in. wide. The reciprocating-table model grinds sheets up to 48 in. wide and in length as required. The roll-feed model handles sheets up to 48 in. wide and any length.

Stewart-Warner Automobile Radio

Deliveries started recently of the new Model 1171 automobile radio brought out by the Stewart-Warner Corporation, Chicago. A three-stud mounting feature is provided which insures rigid mounting in any of three available positions. Electrical connection is made at the ammeter, which eliminates the need for a separate connection to the battery.

The remote-control head, of the speedometer type, is indirectly lighted and can be mounted on the steering post or the instrument panel. It includes a volume control regulated by a switch in combination with a switch lock. The 6-in. electrodynamic speaker is connected to the set with a plug-in cord and is fastened to the front plate of the cabinet, so that both speaker and plate can be removed together when it is necessary to get at the vibrator and tubes.

The all-steel cabinet has a black-crackle finish and ornamental speaker grille. It measures 7½ in. in height, 7½ in. in depth, and 10¼ in. in width.